SUCCESSFUL FARMING

Devoted to
AGRICULTURE, HORTICULTURE, LIVE STOCK,
THE DAIRY, POULTRY AND THE HOME.

MONTHLY. DES MOINES, IOWA, NOVEMBER, 1902. 50 CENTS A YEAR Single N s. 5 Cts

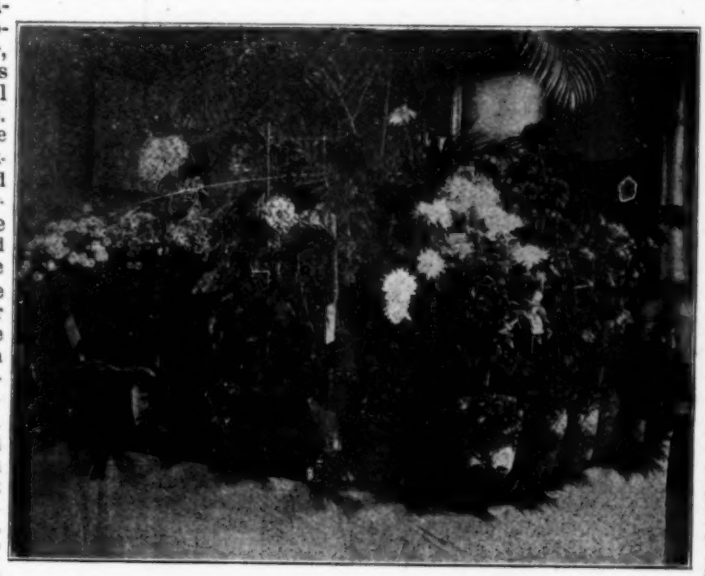
NOVEMBER.

"More welcome than voluptuous gales
This keen, crisp air, as conscience clear.
November breathes no flattering tales,
The plan truth-teller of the year.
What wins her heart and he alone,
Knows she has sweetness all her own."

* * * * *

CHRYSANTHEMUMS.

WHERE IS THERE A MORE popular flower during the year, than the chrysanthemum? It is essentially the November flower, and is now at its height of blossoming in all floral establishments. Twenty years ago the chrysanthemum was treated as a hardy plant and cultivated in out door gardens. Later the plant were gradually improved and found a place among the green house plant. The popularity of this flower has come into prominence within the last decade. In 1888 a floral firm in Massachusetts purchased a variety for the sum of $1,500. This was a move unheard of in the chrysantnemum world, and gave a great boom to the chrysanthemum industry, and as a result annual exhibitions of these beautiful flowers were held in all parts of the country and has continued ever since. The demand for new varieties caused florists and nurserymen to vie with each other in the attempt to produce new varieties. From the small varieties of the garden of long ago have come the present varieties of enormous size seen in the show windows of our floral stores or among the house plants in the window garden. Japan has rightly been designated as the original home of the chrysanthemum. It is their national flower, and has been grown extensively by them for many years. From Japan the chrysanthemum found its way to France and England and later came to America. The "Japs" have taught us many valuable lessons in the culture and improvement of this plant. The best flowers come from plants grown in pots where sufficient amounts and kinds of plant food can be applied as are needed by the plants to perfect their growth. The farmer's wife can easily grow these plants. She can have them in her garden and in September take them inside, where they will furnish abundant bloom during the month of November when flowers are scarce. If large sized flowers are desired pinch off the young shoots as soon as they appear so that the plant will not branch and grow only one stem producing three or four flowers. If a bushy plant is preferred containing 20 or more flowers, disbud the plant giving a symetry to the blooms. In selecting varieties for the window garden it is best to select dwarf varieties. If the plants are grown from seeds, plant the seed in the hot bed early in the spring and in May or June plant them out in boxes or in the open ground, for the summer. Upon the approach of frost remove them in doors. See that the boxes or pots in which the plants are grown are well drained. While the large hothouse grown flowers are the ones thought of in connection with modern chrysanthemum culture, the old-time forms seen in the home garden in days gone by are not to be forgotten. Their chief merit is in hardiness. They may be planted in the open ground and there remain year after year furnishing flowers in profusion extending late into the season after the frost has killed the dahlias and similar semi-hardy plants.



Collection of Window and Hot-house Grown Chrysanthemums.

"So may life's chill November bring
Hope's golden flower, the last of all,
Before we hear the angels sing
Where blossoms never fade and fall."

—Oliver Wendell Holmes.

* * * * *

Winter Evenings for the Farmer.

Winter will soon be here with its long days and short nights. The evenings may easily become one of the most profitable divisions of the day, if wisely used. The farmer will have time to look after his past season's work, balance his books and see how his profit and loss account stands. If he has kept a record of his operations, as every business farmer should, he can see just where his largest profits came from. He will be able to discover some leakages that have cut down his profits. He may be keeping a cow, calf, or horse at a loss. He may find that his poultry yard is filled with hens that are not laying. He will be pretty sure to find a losing proposition somewhere if he turns on the search light and looks over things carefully. Whatever it is, it should be found and the conduct of the farm improved. This done, the evenings may be filled in profitably with liberal reading along agricultural lines, to which should be added topics of national and state importance. Get acquainted with the outside world. No man suffers more from bad government than the farmer. He should scrutinize the doings of public men and the issues of the country in which he is vitally concerned. Farmers' Institutes and Agricultural Societies afford an excellent opportunity for the exchange of ideas. Organize such societies and take an active interest in them. It is important that the young as well as the older folks should be

(Continued on Page Thirty.)

SUCCESSFUL FARMING

PUBLISHED MONTHLY BY THE

Successful Farming Publishing Co.,

213-214-215 Manhattan Building.

Des Moines, Iowa,

For the busy, practical, working farmers of America. It is their paper and claims their support.

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Subscription Price Fifty cents per Year or thirty cents for six months, payable in advance.

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VOL. I NO. 2. DES MOINES, IA., NOVEMBER, 1902.

TO OUR READERS.

We are pleased to announce that the first number of "Successful Farming" has met with a most hearty approval. The subscription list is increasing beyond our expectations. We have decided to give to our subscribers a thirty-two page paper instead of sixteen pages, as in our first issue. We have reached this decision on account of the encouragement received from all sides. A large number of indorsements have come to us from those high in authority on agricultural matters, some of which are published in this issue.

Our aim will be to make each issue better than the previous one. We want our readers to help us and help each other. Send us your successes and failures, tell us all about them and we will work together, and together go forward.

* * * * *

OUR EXPERIMENT STATIONS.

The experiment stations taken as a whole are doing an immense amount of good in developing the agriculture of this country. Occasionally we find a station where more practical work is needed, together with scientific investigations. The individual is quite apt to look for immediate results and becomes impatient at the slow progress seemingly made in carrying on a scientific experiment. But he should not forget that to carry a scientific investigation to a successful finish often requires years of painstaking work. Deductions have to be proved. Facts must be determined before results can be given out. One of the best illustrations, of this feature of station work was shown by Laws and Gilbert, in their famous experiments conducted at the Rothamstead, Experiment Station, England. Many of their field experiments covered a period of over 30 years before they were given to the world. But when they were published no one questioned their thoroughness. The object of our experiment Stations is tersely given in the Third Annual Report of the United States Department of Agriculture. The secretary in referring to the Experiment Stations to be found in the various states says:

"(1) It acts as a bureau of information regarding all questions of practical interest to farmers of its locality; (2) it seeks by practical tests to devise better methods of agriculture and to introduce new crops and live stock, or to establish new agricultural industries; (3) it aids the farmer in his contest with insects and with diseases of his live stock; (4) it defends the farmer against fraud in the sale of fertilizers, seeds, and feeding stuffs; (5) it investigates the operations of nature in the air, water, soil, plants and animals, in order to find out the principles which can be applied to the betterment of the processes and products of agriculture."

With the Department of Agriculture at Washington and the State Experiment Stations working together to improve the various departments of agriculture there is little excuse for the twentieth century farmer who is not up-to-date in modern methods of farm work.

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THE CANADIAN NORTHWEST.

A most wonderful exodus of farmers and investors from the United States has been made into Northwestern Canada during the year. The outlook for next spring, points to a still larger exodus of our young farmers into that country. The cause of this movement may be attributed chiefly to three reasons: First, cheaper farm lands; second, inducements held out by the Canadian government to actual settlers; third, the wonderful yield of grain during the past three years.

The provinces, which on account of their agricultural resources are attracting settlers and investors, are Manitoba, Assiniboia, Alberta and Saskatchewan. The area of these provinces would easily sustain a population of 50,000,000 people. Laws governing the taking of homesteads are broad and the terms most liberal. Wheat raising is the chief industry, although large yields of oats, flax and barley are reported. Excellent ranching facilities may be found in the provinces of Alberta and Saskatchewan. The tide of immigration to this entire district of Canada is rapidly increasing. The railway facilities are rapidly spreading and an era of prosperity has come to our Canadian neighbors.

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Hon. F. D. Coburn, secretary of the Kansas State Board of Agriculture: "Successful farming has a wholesome, clean faced look. It should find an appreciative audience."

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The United States department of agriculture does not agree with Dr. Koch. It reports that its experiments prove that tuberculosis is readily transmitted from cattle when the condition of the subject is suitable.

OUR BEST FARMERS.

The question, "Who are your best farmers?" is a query often heard expressed by the stranger on visiting a farming district for the first time. The answer is pretty sure to come with a touch of pride, when the successful farmers are pointed out, as they may be in any farming community in our country.

We find the homeseeker striving, above all else, to locate as near as possible to those farmers classed as best. By best we mean the ones who are making the most of their chances and are taking advantage of their opportunities—the fellows who are pushing to the front and making records for themselves in their chosen occupation.

Our best farmers are those who get at the bottom of things and keep posted on the up-to-date mehtods employed in general farm work. You will find them carrying on their farm operations with none but the best implements known to the trade; a keen interest taken in the work that is being carried on by our experiment stations, an agricultural journal makes its regular visits to the home the doings of the outside world are noted, crop and market reports are watched, in a word our best farmers are thoughtful. They think, reason, plan and out of it all is developed strict attention to business rules and methods and to the applying of them with courage and persistance. From the work that our best farmers are doing has come a healthy growth in our great agricultural industry. The list of successful farmers is being rapidly increased as the years go by, until no farmer can afford to be found anywhere but in the van of the procession of the BEST FARMERS.

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HOW TO MAKE FARMING PROFITABLE.

Much has been said and written upon how to make farming profitable, the work pay, and above all, the home happy. In reflecting over this matter there seems to come to us a few principles which if applied are sure to bring the results expected in making farming profitable. First, by developing the mind. This does not mean the acquiring of a vast amount of knowledge. A man may have his head filled with knowledge and still prove a dismal failure. Facts obtained in every day work should be compared, their relation sought out, thus developing a process of true reasoning, out of which come hidden truths which tend to enliven the minds to active powers, of practical reasoning and to serve as stepping stones to the attainment of real culture.

You may sow the best of seed on uncultivated ground and reap most unsatisfactory results. Likewise the accumulation of knowledge without the cultivation of the reasoning powers will surely leave an almost barren field.

The successful farmer should be the slave of no man's opinion, neither should he despise the logical consequences of science surrounding him on every hand. He should not forget that true science is always true and aim to shun so-called science which has no sound foundation and leads one astray from the path of truth. Bear in mind that good common sense will often get at the root of matters, as well as much of the teachings of the day. Bring a cultivated mind to bear on the every day work on the farm. The celebrated painter, Turner, was

once asked to explain how he mixed his colors in order to give them their lasting effect. He replied: "I mix them with brains." Thoughtful men know that brains as well as brawn are required to make farming a successful profession.

Secondly. Be thorough in all work, haphazard methods are too often found running on the farm. Let whatever is done be done well. Get the best of everything within your reach that will help to make your work more successful, the best stock, the best seed, the best machinery. Think nothing too small for attention. The waste on many farms is enormous. Fences, gates and general conditions about the premises, by being neglected, becomes the source of much loss. The old addage, "A stitch in time saves nine," is as true today as it ever was. A little thing attended to in the niche of time and not put off until the morrow, returns many fold in the end.

Third. Be honest and truthful, no one can afford to be otherwise. Man is said to have been made upright but often times by the practice of deception he becomes fearfully twisted, a crookedness that is hard to dispose of. Live so that men will take your word, as quickly as they will your bond.

Fourth and last. Practice economy and industry, these are the key notes upon which our successful business men build their vast enterprises. Live within your means. Look on the pleasant side of life. Be satisfied with what you are doing if you would get the most out of it "for nothing of worth or weight can be achieved with half a mind, with a faint heart, with a lame endeavor."

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WHAT SHALL I PLANT.

The question that will soon confront the farmer, if it has not already, is: What shall I plant as a profitable crop for next year? The answer to this question requires sound judgment and careful thought. He will probably reach his conclusions largely by the results of crops this year. This may be done intelligently if he has kept a close watch on the markets during the past season and studied the comparison of prices. To be sure, the farmer can not anticipate the amount of production of any kind of crop, the possible rainfall, acreage, etc., but if he has kept track of things during the past season he will not calculate blindly. He should, rather, plan wisely. Business men are always getting posted on conditions. They know the conditions of all the markets in the country, the average prices for the year, the yields in other countries. They go so far as to estimate the quantity of any article, in which they are dealing, that will be required for the next year. The farmer who is the producer should be equally as well informed. It is just as important that he should look ahead as it is for the merchant. A common error among farmers is to attempt to raise a crop that was in demand the previous season, in this movement the farmers work together. If for instance, the potato crop is short one year, the potato crop will invariably be increased the following year, and if there is an over production then, why the next year they will look for a crop that is short. This is more noticeable in the perishable crops than in the growing of staple crops such as corn, wheat, oats, etc., for if a perishable product he must sell quickly. The policy to be pursued should be to grow those crops that are likely to be short the coming season. Farmers who have followed out this last method usually have thought the matter out themselves and have been benefited accordingly. There is a line of action which may be followed by every farmer and that is to grow products, of the best quality and to ship them to market, in an attractive condition, thereby gaining high prices for excellence. Buyers will seek the best even though the market may be glutted and there will always be a demand in any market for the best.

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WORLD'S HARVEST LATE.

The United States department of agriculture's summary of the crop of the world shows that owing to the remarkably cool and wet summer experienced throughout a considerable portion of Europe, the harvest of 1902 is one of the latest on record. The promise of an abundant yield has been but partially fulfilled in Europe, allowing for grain gathered in a damaged condition and for that actually spoiled. In the instance of bread grains there will be a demand among millers in the countries so suffering, for good dry grain, to mix with the home product.

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THE IRRIGATION CONGRESS.

The tenth National Irrigation Congress was held at Colorado Springs, October 6 to 9. A large number of delegates were in attendance from the different western states. An important matter considered by the congress was the question of merging the National Irrigation Congress with the Trans-Mississippi Commercial Congress. It was decided that the National Irrigation Congress should retain its present idenity until next year at least. The principal discussions taken up by the congress were the workings of the new irrigation law, colonization, and the preservation of the forests. Resolutions were passed indorsing the national irrigation act of June 17, 1902, and the aid rendered the cause of irrigation by President Roosevelt and the Departments of Interior and Agriculture, national and state laws for the preservation of our forests were recommended. Congress was urgently asked to enact at its next session, a law that would carry into effect the recommendations made by the president in his annual message. It was decided to hold the eleventh National Irrigation Congress at Ogden, Utah.

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THE EUROPEAN CITY MARKETS.

City markets in the large cities of the temperate zones at this season of the year are at their best in display of farm, orchard and garden products. Through these distributing centers, the perishable produce of the farm, orchard and garden are very largely sent to the consumers. The origin of the central city market dates back to early antiquity, where we find the "market place" set aside for the disposal of the marketable products of all kinds; gradually the crude systems and methods practiced in that early period became changed to suit the conditions of supply and demand of different countries.

English Markets.

A visit to the principal city markets of foreign countries, especially Europe, furnishes a most interesting theme for study and investigation of methods and systems in comparison with those practised in America. London, the great distributing center of England, and into whose markets a large part of the produce of the world finds its way, has two central markets, "Covent Garden" and "Spitalfields Market." The former, being older and larger, and situated in the heart of London, supplies a large portion of the inhabitants, including the elite. The latter is situated in the east part of the city and supplies the poorer classes of the great metropolis; and in times of gluts or congestion of any product in the market, is by far the better of the two. Both markets practice the same methods of buying and selling. Each is protected by a shed, covering several blocks, the space of which is divided into stalls, auction stands, and temporary store rooms, every available foot of space being utilized. The curbing surrounding the market is lined with wagons from which produce is sold. The rent for wagon and stall space is payed for, the same as in this country.

The markets open for the receiving of produce at 4 a. m.; and for the next two hours everything is astir getting things in readiness for the morning sales. Hundreds of wagons empty here their tons of produce. By six o'clock the sales begin. The first visitors are the retail grocers from all parts of the city, who hurriedly purchase what their customers demand and rush back to business. Following these come the hotel stewards and boarding house agents. Between ten o'clock and noon the wealthier classes make their purchases. Succeeding them come the commission men, who deal largely with the ouside trade.

The English market lacks the variety and taste of display characteristic of the typical American market. This is due to the conservative tastes and habits of the English people and makes it one of the easiest markets to be supplied by the commission men or the producer. Fruits sent by cold storage and rapid transit from all parts of the Occident and Orient, packed and arranged in many ways, find their way into this market at seasons of the year when the home supply is exhausted, practically producing a continuous market the year round. The commission men are made up chiefly of Jews, who are thorough business men and excellent salesmen. Their busiest time is during the apple and potato season. Apples are disposed of in hundred and thousand barrel lots by auction sales. Sample barrels only are exhibited at the auction block. To the outside trade in the smaller cities and towns out of London sample baskets of fruit in stock are sent, by means of which the trade is enabled to purchase. Those seeking sales in the English market find that to receive the highest prices, uniformity of package, packed to suit the consumer, is the secret of success. The English buyer appreciates the attempt of the seller to establish a reputation by the shipping of first-class, graded goods, and never forgets, either in price or patronage.

Markets on the Continent.

The city markets of continental Europe vary greatly. In some of the countries high types of markets may be found; but generally the opposite is the rule, and in many instances the methods employed seem indeed antiquated. In Holland the market gar-

[Continued on Page 7.]

Agriculture

The farmers of our country are requested to contribute to this department.

One of our large plow manufacturing companies in this country has recently received an order from South Africa for 18,000 eight-horse plows The United States stands at the head of the column among all countries in the manufacture of farm implements of all kinds. Her farm machinery goes to all parts of the world.

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Northeastern Colorado is the first section selected by the government for a reservoir to be built under the new national irrigation law. Thirty-nine townships along the Platte river, extending from Sterling into the corner of Nebraska, have been withdrawn from public entry.

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Between the many who are poor and the few who are rich stands the American farmer. The Census Bureau in reporting on the value of farming property show conclusively that after all, so far as the actual wealth is concerned the farmers are capitalists. The estimate given is as follows: 5,339,657 farms of the United States are worth $16,674,690,247. Of this amount $3,560,198,191, or 21.4 per cent, represents the value of buildings, and $13,114,492,056, or 87.6 per cent, the value of land and improvements.

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GRINDING KAFFIR CORN.

Many of our readers are interested in the growing of Kaffir corn and the using of the grain in feeding stock. Mr. J. C. Huggins describes in the Kansas Farmer a method for grinding Kaffir corn. It is as follows:

Most sweep mills will not grind it fine, and the millers want too much for grinding it. If the burr is quite worn, so much the better. Have the Kaffir corn dry, put a basketful into good solid barrel, chop with a long handled, sharp spade, add some more heads and chop, and so on. Fill your mill and continue to chop and grind. You can have it as fine as flour if you want to, and it makes fine swill to feed thick or thin. The Kaffir corn stem keeps the seed from feeding too fast and it grinds nicely, but not so fast as corn, probably about five bushels per hour. This depends on how fine you grind it.

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IMPORTANT CROP REPORTS.

The U. S. Department of Agriculture, in their November report, give the following data regarding some important crops:

During October 14,971,318 bushels of eastbound wheat passed through the American and Canadian canals at Sault Ste Marie. All other eastbound grain passing through both canals during the same period amounted to 8,425,143 bushels. The flour movement was 1,298,751 barrels.

The estimated shipments of celery from California for 1901-2 are put by commercial authorities at 1,200 carloads, against 1,100 carloads in 1900-1 and 700 carloads in 1899-00.

The broom corn crop of the United States in 1902 is estimated at 39,800,000 pounds from an area of 76,300 acres. The yield in the previous year was estimated at 37,150,000 pounds.

The Fresno Republican estimates the raisin crop of California in 1902 at 100,000,000 pounds, the largest crop with one exception ever produced in that state.

Commercial estimates indicate a flax seed crop in the United States in 1902 of about 27,000,000 bushels, a record crop.

The 1902 peppermint-oil crop of the United States is generally conceded to be very deficient, being generally estimated at about 130,000 pounds, against an average annual production of about 200,000 pounds.

Mr. George Dornbusch's Floating Cargoes Evening List, London, estimates the world's wheat crop of 1902 at 2,892,000,000 bushels.

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WOMEN AS FARMERS.

MANY WOMEN of this country are taking a direct part in farming as a business. They have always taken an interest in an indirect way, and the yearly profits on the farm rests largely upon the farmer's wife, but the modern feature of woman's work on the farm is the running of their own farms independent of anyone but themselves. Mrs. Virginia C. Meredith, professor of domestic economy in the Minnesota School of Agriculture, who has been an active farmer for many years, regards the future of the American woman farmer as most promising, and points to the census statistics which show hundreds of women listed as farmers. Professor Meredith further says:

"The work is ideal, and contrary to the opinion of the uninitiated majority, eminently feminine," says Mrs. Meredith. "Why feminine? Because farming means infinite detail, and every woman, however unintelligent otherwise, possesses a genius for detail. Then it gives her a home, a thing almost impossible to secure in the very start, at least, in most fields of feminine labor, and most important of all, she meets not with opposition, but with chivalrous co-operation from the men in the business. Sir Charles Dudley, an eminent Englishman, writing of the American, says that the distinguishing thing about the farmers is their respect for women. We women who have made farming our business can gladly vouch for that.

"Another idea, now nearly exploded, however, is that a woman would find it difficult, if not impossible, to get men to work for her. For my part, I, who am both housekeeper and farmer, could sooner and more easily hire twenty farm hands than one servant girl. I think this due partly to the fact that men who work on farms know that they receive better treatment as a rule when in the employ of women.

"As regards the profits in the business, both my friends and myself can testify that farming pays. For instance, on thirty-three head of Shorthorn cattle which I sold last fall, I made an average of $476. Other women I know are doing just as well. Some of them are married women, who, having inherited farms, are running them successfully, and without any aid from their husbands, either. Miss Gertrude Norrish of Hastings, Minn., a cultivated and highly educated woman whom I know, is making a brilliant success of a farmer. Other young women are running farms in partnership with their fathers; and do their advertising under the head of Mr. and Miss Blank.

"The girls here, while they are not taking full courses in the agricultural department, are many of them taking courses in dairying and the feeding of cattle, enough to illumine the business of farming at least.

"Of the hundreds of women now working in cities from whim I receive letters asking for information on farming and the kind of farming that best pays, I invariably advise stock farming. It is the most profitable, as well as the highest kind of farming, and women, most of whom possess a germ of the maternal instinct, are especially fitted for it."

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SUGGESTIONS ON TUBERCULOSIS.

Dr. A. S. Heath, V. S.

How shall tuberculosis in our herds and dairies be remedied, on the principles of justice and economy to the public, to the farmer and to the dairyman?

The question is a most important one and one that has been discussed a great deal during the past few years by our scientists and practical men The following suggestions appeal to me as important in the treatment of this disease and to prevent its spread and development:

1. Breeding from none but strong, vigorous, healthy animals, especially avoiding in-and-inbreeding, and breeding separately from the dairy.

2. Selection of animals of the above characteristics, with aptitudes for special requirements—such as meat, milk, or butter, or cheese, or for labor.

3. Testing herds by tuberculin, where enlarged glands about the eye, head, neck, shoulders, flanks, or (in milk cows) behind the udder may be discovered by the farmer.

4. A careful scrutiny of the food, of stables, or water, ample air supply, and daily outdoor exercise, scrupulous cleanliness of the dairy and utensils, and by having post-mortem examinations made by an expert veterinarian or physician of all animals that die.

5. By immediately separating all sick animals from the well ones.

6. By great care in admitting strange animals into the herd; such should be kept apart from the herd.

7. By liberally feeding a herd with sound food, liability to infection is avoided, and animals in the early inception of the evil may be promptly slaughtered for food, if before and after slaughter they can pass a conscientious inspection.

This infection is not speedily fatal, like anthrax, but is insidious, slow, and may exist for months or years without showing to the uninitiated, any evidences of the disease, though in an advanced stage.

The danger line in tuberculosis is so uncertain in the meat and milk, that its absence is the best safeguard against human infection.

Tuberculosis discharges from the mouth and nose reinfect the animal already diseased. The farmer should be able to detect this state. In this self-infection, the cumulation speedily contaminates the entire system.

For myself I should not be afraid to use meat or milk of tuberculosis cows in the incipiency of the malady, for in the absence of statistics I believe that in all the contagious diseases of our flocks and herds, comparatively few human beings ever become infected. Therefore, thoughtless haste in

the destruction of our domesticated animals should not be tolerated by the intelligent officials of the state Nor have I a doubt that I have maintained sound health beyond the average lot of man, though I may have thrived on meat and milk not always free from suspicion.

Fresh milk, drawn from healthy cows fed on sound food, with an ample supply of pure air and pure water never contains bacteria at the time of milking. All mischievous bacterial busy bodies have an external source of contamination of milk.

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Dr. L. O. Howard, entomologist of the Department of Agriculture, writing of the manner in which seeds are carried to great distances, by birds, mentions an experience which Darwin once had with a wounded partridge. Adhering to the leg of the partridge was a ball of earth weighing six and one-half ounces. From the seeds contained in the ball he raised thirty-two plants belonging to five distinct species. In this connection it might be well to note that many of our standard varieties of berries have been chance seedlings, the seed of which have been supposed to have been dropped by birds.

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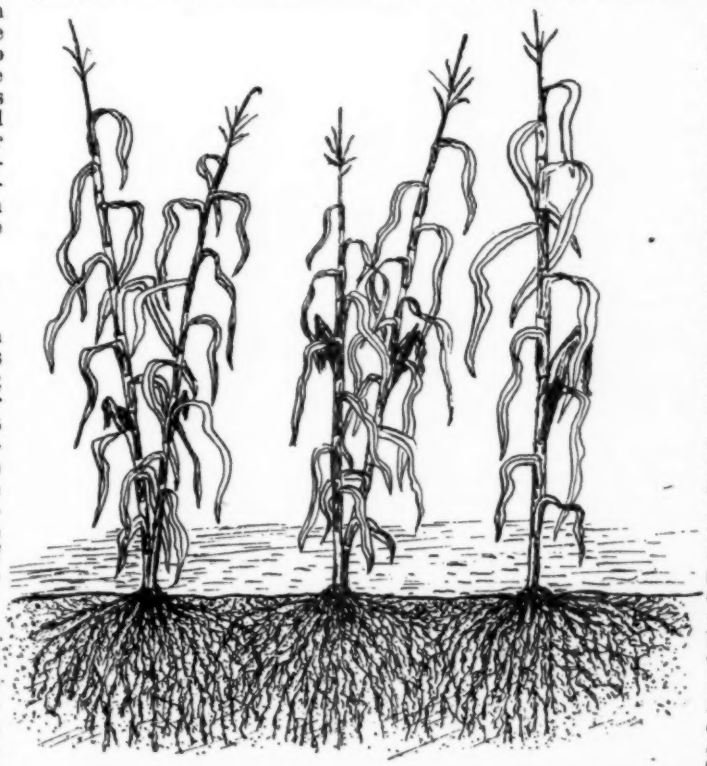
IMPORTANCE OF ROOT DEVELOPMENT.

Plant developement from infancy to maturity depends upon a proper root system; in order that the cultivator may influence proper plant growth and aid the fertility, texture and drainage of the soil, it is of the greatest practical importance that he should have a general knowledge of the roots of plants and the parts they perform in fixing the plant in the soil, absorbing plant food, and in some instances their mission as store houses for food. When the seed germinates it feeds first on the stored material surrounding the embryo. This process continues until the plantlet is formed, as soon as this supply is exhausted, and weaning time has arrived, young roots are formed to aid in gathering and conveying food from the soil to the plant. As the roots push out in search of food they divide and subdivide, the small root hairs find their way between the soil grains, taking up water, nitrogen and ash ingredients for the plant's use, thus expanding the root into a most wonderful absorbing surface, much greater than is generally supposed, bearing evidence that nothing short of a large root system in most plants will suffice to meet the requirements of the plant.

A simple illustration may be found in the root system of our potted house plants or individual field plants of corn, wheat, grass etc., (See cut) all of which show plainly an intricate root system sent through the soil to obtain food and water for the plant's needs. With the farmer rests the task of equalizing the food supply and conditions of the soil, in order to bring about a systematic and natural root development. To accomplish this the roots should be surrounded with proper tillage, soil aeration and plant food. The farmer should bear these points in mind in preparing ground for future crops. If he will but examine any well tilled soil surrounding our common field plants, he will observe that the first two or three feet of soil beneath the surface is filled with a network of fine roots.



Roots of corn spreading out in well tilled soil, drawn from life.

THE MANUFACTURED PRODUCTS OF INDIAN CORN.

We have been interested for some time in the process employed in the manufacture of Indian corn into products, that have come into general use during the last few years. This particular industry has become a large one in this country and has taken an important position in our commercial world.

Thinking some of our readers might be interested in this industry we askd Mr. W. P. Kennard of Kenosha, Wisconsin, an expert in this line, to tell us about the manufacture of corn, into starch, glucose, corn oil, rubber substitute etc. He writes as follows:

As a rule corn is now all shelled when received at the glucose or starch works. It is unloaded by machinery and handled by means of screw conveyors and bucket elevators, into steep tubs called steeps; it is cleaned on the way and all dirt, nails, chaff, stray cobs etc., removed by a machine; it is also weighed in hopper scales. The steeps are round wooden tubs holding some 1200 bushels—a modern factory of fair capacity will consume 20,000 bushels of corn daily. The corn is steeped in hot water charged with sulphurous acid which helps to soften the corn quickly, which takes about twenty hours soaking. The acid is made on the premises by burning sulphur and passing the fumes up over coke, the water flowing down over the coke—in a sewer pipe tower. The corn now soft and swelled is passed through a series of mills and rolls, some for grinding, and some for crushing, some are steel mills, and some are French Buhr or stone mills. The Kernel of corn consists of three parts, hull, germ and starchy portion. In crushing, the hull and germ being tough from soaking are not broken to speak of, so are easily separated from the starchy portion by sieves. These hulls and germs are then separated from each other by being passed through a tank of water in which is an agitator, the germ being filled with oil floating off on the top and the balance settling. These germs are now washed over silk bolting cloth with fine streams of water on what is called a shaker, being agitated back and forth quickly by an eccentric; being on an incline the washed germs finally fall of the end of the frame into a screw conveyor and go into the feed house for further treatment as a by-product.

Separating the Hull, Germ and Starch.

The hulls after separation from the germ in the tank are also washed of any remaining particles of starch and are then conveyed to the feed house for further treatment as a by-product. All starch washed off the hull and germs in passing over the silk shakers, flows with the water through the meshes of the silk and into a wooden trough, thence to tubs and tanks to mix with other starch liquors. The main starch liquor is obtained by beginning the starchy portion of the kernel after the hull and germs are separated from it. This is done over stone buhr mills with a stream of water flowing into the mill; this mass is then pumped up and over silk shakers where it is again washed by the streams, everything flowing through the silk and away except the woody fire, etc., which pass off to the feed house over the end of the silk sieve. The starch liquor is now all collected and settled and washed with clean water, being agitated; then, about the consistency of cream it is pumped over long runs or starch tables, either wooden or covered with sheetirone. These runs are from 125 to 150 feet long, 220 inches wide, 6 to 8 inches deep and side by side cover a large area, usually a whole building; these are inclined from top to bottom slightly. This starch liquor is fed in a constant small stream at the high or top end of each table and flows the whole length; the starch settles by specific gravity in passing over and nothing but pure gluten in solution should pass out of the waste pipe hole at the tail end; this gluten is pumped over to tanks in the feed house where it is settled, the water runs off and then is pressed in filter presses into cakes; another by-product. These runs or starch tables gradually fill—should fill up say six inches in six hours. Then the stream of starch liquor is shut off and clear water turned on and surface washed. This wet or green starch is quite solid and heavy and is now shoveled out by men with wooden shovels, the men wear wooden shoes; by means of endless belts and conveyors these broken chunks of wet starch are carried to other tanks, called breakers, where the starch is again washed and agitated and settled.

The Source of "Pearl Starch."

Up to this point the process is the

(Continued on Next Page.)

THE MANUFACTURED PRODUCTS OF INDIAN CORN.

(Continued from Page Five.)

same whether for a glucose factory or for a domestic or culinary starch factory for laundry and table starch. If for laundry starch or other commercial starch the liquor is settled and washed several times in these breakers and then pumped to vats, mould boxes, etc., being finally cut into cubes, wrapped in blue paper and dried in kilns by slow heat to form the large lumps which the trade now demands; the same starch is powdered when dry for culinary or food starch, put up in yellow packages and called corn starch.

This same starch is dried quickly and cheaply by means of trays and a hot air blast with a fan, and then forms long crystals and is called "Pearl Starch." This is sold in barrels for commercial purposes, such as are used by laundries, cotton and woolen mills, for sizing warps, for paste, for dye works, calico printers, bleacheries, etc., and when powdered, for a filler for baking powder and for candy moulds for confectioners. Owing to the simple and quick way of drying it costs less than half what the lump starch costs, all of which has to be handled and rehandled in small cubes —one dries in a day and the other in a week—but the main difference in cost is in the labor; the desire of the public for the starch in the form of a lump or irregular cube-like crushed stone, instead of a long crystal, is simply a whim to which they have been eudcated by tne manufacturers, and for which they are willing to pay over double the price. It amounts to nothing, as both are dissolved in water before using.

This Pearl or Commercial starch is now a regular product of a glucose factory, because it can be sold in barrels and in carload lots and is a rather new field ior them.

Making the "Sweets."

Now, go back to the starch liquor in the breakers of a glucose factory. From the breakers it is pumped to the sugar house or refinery proper. A quantity at a time is taken into a copper cylinder called a convertor or digester. A weak solution of acid is added and steam turned on until a certain boiling point is reached; then a sudden change takes place, and the milky liquor becomes colorless and is called sweet water. In the next process this trace of acid is entirely eliminated and this sweet water is boiled in closed copper pans, out of which the air has been pumped—and called vacuum pans—between the boilings it is run down through large iron cylinders filled with treated burnt bone or animal charcoal called bone black, the greatest filtration known, turning the slightly yellow liquor into crystal whiteness and removing all traces of impurity. A final boiling in the vacuum pans brings the liquor to 41, 42, 43 or 44 degress Baume at 70 degress Fahrenheit, as wanted by the trade; then to the warehouse where it is barreled hot. On the way over some manufacturers run it through regular filter presses with clothes between the filter plates to give it an added brilliancy, especially if for table syrups. After each run of liquor over the bone black this charcoal has to be burnt over again or revivified in kilns built for that purpose, as the pores of the charcoal becomes filled with matter which has to be burnt out; at each burning there is a small percentage of loss of bone coal.

The 41 glucose is used for mixing with molasses and as a body for all table syrups. The 42 is used as a body for all cheap jellies, jams and preserves; the 43 and 44 for all candy manufacturers, chewing gum, brewers, refiners, wine rectifiers, and tanners for stuffing leather. Altogether it is the cheap sweet of the world and is now exported in immense quantities to every principal port the world over; ten years ago this export business was a small matter, and went to but few ports.

There is about 20 per cent less saccharine in the product from corn than from cane sugar or sugar beets, but the price is 1½ c per pound, as against over 5c per pound for cane. To make what is commercially known as grape sugar, instead of glucose, the conversion by acid and heat into sweet water takes place at a higher temperature or the heat is applied longer; subsequent operations are the same, except the hot liquor is not run into barrels in the warehouse, but into pans, where it solidifies when cold, and is then broken up and shipped in bags, large quantities go to the ale brewers of England. If this grape sugar could be made to granulate or form crystals when cold so cane sugar, which does granulate, could be adulterated with it, it would revolutionize the sugar trade. Millions have been spent in experimenting to no avail, the corn sugar has no grain and breaks up like marble or broken stone used for top dressing macadam roads.

Manufacturing the By-Products.

Now, we have covered all but the gluten from the starch tables and the hulls and germs and woody fibre from the silk shaker sieves, which were previously sent over to the feed house, and from these all by-products are made, which now form a large part of the revenue of both glucose and starch manufactories, and the income from these sources has greatly reduced the selling prices of the principal products.

In the feed house the cakes, or residue, from the gluten from the starch tables, and the woody fibre from the silk sieves, are formed by mixing the above together and pumping them through filter presses, under pressure, with clothes between the press plates; the water which runs off should be nearly clear and let off through the sewers.

The cake thus formed is broken up and mixed with the hulls which have already been sent over to the feed house from other silk shakers, as previously described. This mixture is dried by slowly revolving large iron drums or dryers, filled with steam pipes, the feed or mixture entering damp at one end and coming out dry at the other end.

After a slight grinding this mixture is sold in bulk and in carload lots, or in bags at slightly under the price of corn meal for cattle feed, and different factories give it different names, such as Chicago Gluten Meal, Cramm Gluten Meal, King Gluten Meal, Buffalo Gluten Meal, Rockford Diamond Gluten Meal. This feed by analysis shows 32 to 34 per cent protein, 3 to 15 per cent fat, the higher numbers coming from the starch factory feed and the lower numbers from the glucose factories.

A few years ago this gluten meal was much richer in fats and oil, as the germ, or oil sac, was also mixed in with the hulls; after years of experiment this oil sac is now separted before coming to the feed house by floating off in a tank of water, as previously described, and is handled by itself in this way: The germs are dried in revolving dryers, same as described for the gluten meal, then they are conveyed by screw conveyors to the oil house, a separate building and a new feature. Here the dried germs or oil sac—are handled the same as cotton seed or other oily seeds—the are ground by sets of steel rollers, then soaked, then steamed or cooked, and this mass is formed into cakes, laid between canvass cloths and many layers at a time squeezed between plates in hydraulic oil presses, and thus the oil runs out; this oil is called corn oil, and is sold for use in manufacturing ready-mixed paints. It is excellent for many purposes, and, if bleached, can, no doubt, be mixed with olive oil for salad oils and putting up sardines. The cake, or residue, from the oil presses is kept solid as it comes from the presses and is packed in bags for export trade to England and the Continent, and brings a high price, being very rich in fat.

It is ground when it is fed and mixed with other cheaper feeds for cattle and horses, and, no doubt, is largely used in dairy districts. Of late, a part of the corn oil made has been mixed with sulphur and other chemicals and the whole mass heated and stirred, the oil becoming so-called vulcanized, forming a substance similar to raw Para rubber, and called by the trade name of Kommoyd. This rubber substitute is being used in making cheap rubber boots and coats, a small percentage of it being mixed with pure rubber.

In a properly run factory nothing but clear water should go down any sewer or waste pipe, everything else being utilized in some form; and practically every man, woman and child uses daily in some form the product of a kernel of corn. The business has grown in thirty years from a beginning to a daily consumption of about 110,000 bushels of corn into glucose and grape sugar, and about 60,000 bushels daily into starch of all kinds. The present tariff bill gives a duty of 15 per cent ad valorem on glucose and grape sugar, but the duty is a dead letter, as foreign competition is not to be feared, as we are the corn-producing nation.

A very small quantity of German glucose, made from the starch from potatoes, is imported by some of the high-priced retail fancy candy manufacturers to suit the whims of their imported workmen, and for which they pay five times the price of the domesic product.

TAKE OUR ADVICE

and write today for our 80-page Grocery List. We send it FREE to heads of families. It will enable you to save 15 to 40 per cent on your groceries. Our shipments go everywhere and always prove satisfactory. Write for Grocery List today.

Montgomery Ward & Co.,
Chicago

I Can Sell Your Farm

or other real estate for cash, no matter where located. Send description and selling price and learn my wonderfully successful plan. **W. M. OSTRANDER,** North American Building, Philadelphia, Pa.

THE EUROPEAN CITY MARKETS.

(Continued from Page 3.)

dens of the cities are on the docks bordering the canals passing through the streets. Produce is sold from these docks and from the boats. Market hours are from 4 a. m. to 10 a. m. All sales are made in a quiet way and with a lack of interest. While the fruit and vegetables are spotlessly clean, they are crudely exhibited, usually in second-hand baskets, barrels or crates, occasionally in piles in the bottoms of the boats. All flowers are most artisically arranged, and find ready sales, as the Holland people are great lovers of flowers.

In the Austrian cities the markets are conducted in open squares set aside by the government. The produce is sheltered by small tents, awnings and huge umbrellas during the market season, in spring, summer and fall. Warehouses and retail dealers consume the products in the winter. In Vienna tolls or fees are collected on all produce sold within the city limits. As the bulk of the fruit and vegetables is sold from wagons and temporary stands, order and display are practiced but little. The huckster's business is tremendous. It is estimated that at least one-third of the city's population is supplied with food by them. The apple shipments to the cities of Austria from the surrounding country are made chiefly in boxes, each specimen being wrapped in tissue paper. Only first-class fruit is shipped in this manner, from seven to eight hundred apples being placed in the box. Second-class stock is shipped in barrels, carefully graded and labeled.

The city markets of Italy are very unsystematically arranged; vegetables, fruits, wines, macaroni and cheese are exhibited in the same booth, giving an intermingling of odors. Yet in spite of this irregularity of arrangement, the Italian is noted for his wonderful methods of display in showing his products. Peaches, plums, prunes and grapes may be seen exhibited on fresh leaves and in baskets lined with cut tissue paper of different colors; onions braided into strands of corn husks, along side of pyramids of "palmagean" and "switzer cheese"—all efforts being made to exhibit in as attractive a style as possible. This is a feature observed among the "Dagoes" in our own country, who make our best hucksters and street venders. From early morning until late in the evening, the Italian market is a continual babble. The produce found there is chiefly made up of home products, a large amount of which is shipped abroad.

The German markets are patterned quite extensively after the plans and methods of the English and French markets. They are very clean and systematically conducted. Large quantities of foreign fruits of various kinds may be found at all times of the year in these markets, for Germany does not begin to produce fruit in sufficient quantities to supply the home demand. Strenuous efforts have been put forth during the past five years to encourage the planting of fruit plantations and to build up the export trade. The latter step has resulted in the building up of a strong trade with the United States. Fruits, such as apples, pears and plums, are shipped to the city markets from the country districts in bulk, usually in carload lots. They are carefully sorted in the warehouses and sold to the city trade. Where outlying towns are to be reached with apples, they are shipped in roughly built barrels, the heads tied in by ropes. Poor grades of fruit are turned into wines, jellies and syrups, so that there is but little loss to the fruit growers.

France surpasses he world in her well-managed city markets. The Central Market of Paris is the largest in existence and is most elaborately constructed. It supplies the entire city, besides a very large export trade to outside towns and cities. The best methods of packing and handling fruit and vegetables of all kinds are carefully studied and practiced. Co-operation in marketing fruits and products is practiced largely by the producers, and has shown most remarkable results. The market opens at 4 a. m., and by 8 a. m. all selling ceases and the market is cleared and closed. The results of this is very active work on the part of the sellers and buyers. As France produces such a wonderful variety of products, the City Market is always teeming with fresh produce. The majority of the persons found in the market selling the farm and garden products are women who are neatly dressed, wearing white aprons and caps. The men are dressed in white smocks, everything bearing the air of neatness. As much care is shown in exhibiting the produce as in the personal appearance of the sellers. Flower stands are in profusion and their sales are enormous. The French people are noted for their ability to make nearly everything raised salable, and for their economy.

Comparison With the United States.

In comparing the city markets of Europe and the United States we should bear in mind that "This country is the country of opportunity;" and if the producers for these markets would carefully guard their interests they could use the city market and its auxiliaries to the best possible advantage The resources are indeed abundant, but the problem of distribution awaits solution. Our "city markets," from which our fruits and produce are distributed, are not thoroughly understood by the producer. We find too many men between him and the consumer. How to do away with these men and reach the consumer more directly is the burning question of the day. Our country is largely free from landlords, but it is cursed with an army of speculators preying upon the producers, practically gambling with necessities and robbing on all sides both the producer and consumer. These are the questions the fruit grower and farmer by co-operation should be coping with.

The present tendency toward the improvement of methods in our "city markets"—the taking of practical ideas from foreign markets and adopting and utilizing the best features of such markets in our own—is surely a step in the right direction. If possible the farmer or fruit grower should be his own commission man; or, if that be not possible, he should strive to select the most reliable dealer that may be obtained. Afer raising the produce he should learn to sell it for the most money, remembering that the produce which brings the most is that which is packed the most neatly and with greatest uniformity and honesty. He should find out what kind of packages are sought for most by the consumer; he should know his business thoroughly, have confidence in himself and make those with whom he trades have confidence in him. In conclusion, the producer should remember that he should try to cater to the tastes of the consumer, with himself as his own business manager.—E. E. F.

MARKETING PERISHABLE PRODUCTS.

One of the greatest boons to the proper marketing of all perishable farm products is our present improved system of cold storage, to be found in all our large cities and trade centers to which the bulk of our products are shipped each season. The remarkable development of refrigeration in recent years has excised a wonderful and important influence upon the entire commerce of our country, the trade with foreign countries being greatly enhanced. A score of years ago the landing of perishable products from the antipodeh, in our markets, in good condition, was undreamed of, but the inventive mind solved the problem. Methods were devised by which products not covered with tin or other metals but simply surrounded by dry air of a low temperature are shipped long distances, playing an important part in the world's commerce. The low temperature maintained in this process, which is suited to different products, is chiefly used to rrest all progress of decay which is set up by the agency of germs and which goes on in all tissue from the period of ripening to that of final destruction. This exchange of products between countries and parts of countries at different seasons of the year, aside from pecuniary gain, accelerates change of diet. As the principle of all cold storage is that warm air rises and cold air falls, cold storage systems are used in many hospitals and sanitary institutions to regulate ventilation. The process employed in the early use of modern cold storage was the so-called "cold air machine," in which cold was produced by compression of air, the air being cooled while in this state by means of water and by subsequent expansion in the performance of the work of ordinary air. Although the system was simple in construction, the cost of furnishing the power was exceedingly great; hence a more economical plan was brought into general use

Ammonia System.

in 1890, and which was known as the "Ammonia Expansion System." Although there are many systems used, they all follow the same general principles. The "Linde System" of cold storage, introduced in 1875, by Prof. Linde of Munich university, as among the best. The nature of the "Ammonia System" is very simple, the principle being to produce the evaporation of a liquid and subsequent recovery by condensation. Liquid anhydrous ammonia is used chiefly, although other similar volatile liquds may be used. The heat necessary for evaporation is abstracted from surrounding bodies, thus reducing them in temperature to points of refrigeration. These bodies are either brine, water or air. The one in most common use is brine. The refrigerator consists of wrought iron coils about 1½ inches in diameter, tested to a pressure of about 2,000 lbs. to the square inch. Ammonia vapor is subjected to condensation in the condenser, and in this highly condensed from it is permitted to escape into the refrigerator coils through a regulating valve; escaping thus quickly, it expands. This expansion necessarily absorbs heat from the bodies surrounding the coils, thus reducing the temperature of the solution through which they pass. This is usually an uncongenial solution of brine in which calcium chloride is sometimes placed so as to permit a very low temperature being reached in the

liquid. The liquid may then be used as a transmitter of cold in one of two ways. The first and most common is by the constant circulation of cold brine from the brine tank, through pipes placed in the refrigerator chambers, the result being not only the absorption of heat from the air, but also the condensation of moisture on the exterior of the system of brine pipes. The second is the cooling of a series of extended surfaces bounding the shallow tank in which is found the brine and evaporating coils, the entire tank being placed in an insulated passage through which an air current is being constantly passed by the force of a fan. The air passing over the cool surfaces becomes reduced in temperature and is conveyed to the chambers or rooms to be refrigerated. On steamers a system is quite common and may be found on the New Zealand line of steamships where the ammonia coils cover a large surface either in the upper parts of the room to be cooled or in a specially constructed chamber. In the latter instance the air is driven by a fan from the chamber to the rooms to be cooled. In discussing various systems I have found the consensus of opinion to be in favor of the system in which the air is cooled by the extended surfaces in a brine tank. The advantages of modern refrigeration over the old ice methods are in keeping the rooms refrigerated at a stable temperature for any desired length of time, saving of space in construction, and a corresponding decrease in the cost of labor

Period of Storing.

necessary to carry on the process. The period that perishable products can be kept in a cold storage depends upon the products and their condition when stored. My own observations in this and other countries have included the London Dock company cold storage plant, where Australian beef and mutton are sold on the market at top prices after being kept for over three years and even longer at a temperature of between 4 and 5 degrees below zero F.. Correspondingly butter and poultry have been preserved for a like period. Apples have been kept in modern cold storage for two years and exhibited in a sound condition. In most cold storage plants the temperature is kept at from 34 degrees to 40 degrees for perishable products that are to be placed on the market in a few days or weeks. At this temperature butter and eggs can be kept five to ten months in perfect condition. In fruit products, strawberries, black raspberries and cherries two or three weeks; peaches and plums from three to five weeks; apples four to twelve months, in some varieties of later sorts very much longer; pears from two to four months; bananas and oranges from two to three months; melons from three to eight weeks. Vegetables vary from two or three weeks to an almost indefinite period, the potato being one of those which will keep longest. In all cases if the temperature is lowered the keeping period is proportionately extended. It is important to note the adaptability of various fruits to cold storage treatment, which opens up at once the question of production of adapted va

Preparation of Products.

rieties. In placing fruit on our markets great care should be exercised. The brain as well as the brawn must be brought into play. Too often is the fruit grower met with this report from his commission man: "No sale for fruit, either 'slack,' 'watery' or 'decayed.'" In nine cases out of ten, if carefully looked into, this will be found to have been caused by imperfect packing. No fruit should ever be packed while in a wet or warm condition. Nothing is more sure of hastening decay than having fruit picked and packed when wet or hot. To avoid this feature, pick the fruit when dry, and place it for a few hours in a cooling room before packing. Avoid handling more than is necessary. Pick by the stem whenever possible, to preserve the bloom and fruit and prevent bruising. Aim to handle fruit but twice in placing in market packages. Sort and grade fruit carefully and uniformly, using such packages as will best suit the trade, and not the individual fancies of the grower. See that all packages are properly labeled with grade of fruit, name of grower and name of the firm to whom the fruit is shipped. Never market a poor grade of fruit where you hope to secure a permanent market. Make such packages as will secure perfect ventilation and still be tight enough to hold the fruit firmly in place. The best market available should be sought, and money used to reach this end is never wasted. A "penny wise and pound foolish" policy is of little use. Remember that at this end of our farm and orchard work, business begins, and as in all lines of business, requires tact.

E. E. F.

* * * * *

He who acquires knowledge, without imparting it to others, is like a myrtle in the desert, where there is no one to enjoy it.

* * * * *

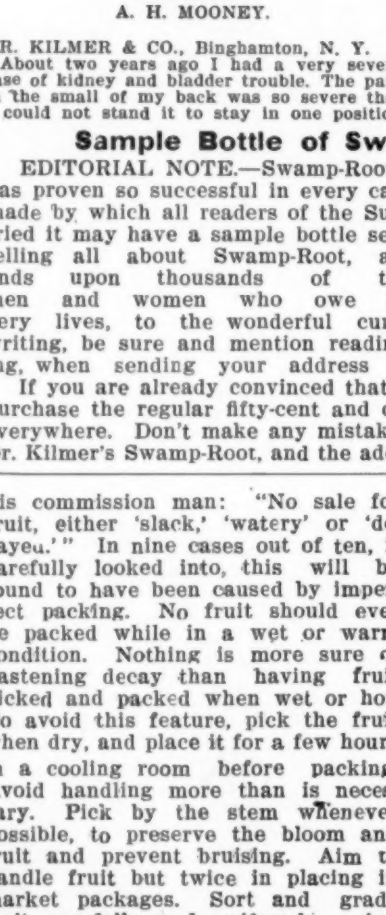
Arrogance is a kingdom without a crown.

WEAK KIDNEYS AND BLADDER TROUBLE.

Had to Pass Water Very Often Day and Night.

Cured by the Great Kidney Remedy, Swamp-Root

Among the many famous cures of Swamp-Root investigated by Successful Farming, the one we publish this month for the benefit of our readers, speaks in the highest terms of the wonderful curative properties of this great kidney remedy.



A. H. MOONEY.

DR. KILMER & CO., Binghamton, N. Y.
About two years ago I had a very severe case of kidney and bladder trouble. The pain in the small of my back was so severe that I could not stand it to stay in one position more than a moment or two, and was obliged to pass water very often day and night. I tried medicines and doctors without getting relief. Noticing an advertisement in the Topeka State Journal of Swamp-Root, I determined to give it a trial and bought a bottle. By the time I had finished the first bottle the pain had entirely disappeared from my back. The pain and frequent desire to pass water ceased. However, I continued to take the medicine, using about six bottles in all. That was over a year ago and I have had no return of the trouble since.
Chief Engineer, State Capitol Building.

Jan. 2d, 1902. Topeka, Kan.

Weak and unhealthy kidneys are responsible for more sickness and suffering than any other disease, therefore, when through neglect or other causes, kidney trouble is permitted to continue, FATAL RESULTS ARE SURE TO FOLLOW.

We often see a relative, a friend or an acquaintance apparently well, but in a few days we may be grieved to learn of their severe illness, or sudden death, caused by that fatal type of kidney trouble—Bright's Disease.

The mild and extraordinary effect of the world-famous kidney and bladder remedy, Dr. Kilmer's Swamp-Root, is soon realized. It stands the highest for its wonderful cures of the most distressing cases. A trial will convince any one—and you may have a sample bottle sent free by mail.

Sample Bottle of Swamp-Root Free by Mail.

EDITORIAL NOTE.—Swamp-Root has been tested in so many ways, and has proven so successful in every case, that a special arrangement has been made by which all readers of the Successful Farming who have not already tried it may have a sample bottle sent absolutely free by mail. Also a book telling all about Swamp-Root, and containing many of the thousands upon thousands of testimonial letters received from men and women who owe their good health, in fact their very lives, to the wonderful curative properties of Swamp-Root. In writing, be sure and mention reading this generous offer in Sucessful Farming, when sending your address to Dr. Kilmer & Co., Binghamton, N. Y.

If you are already convinced that Swamp-Root is what you need, you can purchase the regular fifty-cent and one-dollar size bottles at the drug stores everywhere. Don't make any mistake, but remember the name, Swamp-Root, Dr. Kilmer's Swamp-Root, and the address, Binghamton, N. Y., on every bottle.

Live Stock.

Special contributions by farmers and stockmen welcomed.

Put in the rainy days renovating the barn buildings. Get them in readines for the winter.

* * * * *

Horse collars are best fitted to the horses at the harness shop. Galled necks or shoulders affect the nervous system and tends to cause general debility.

* * * * *

The largest goat ranch in the world is near Lamy, New Mexico, where Charles S. Onderdonk has ten thousand goats. Angoras are raised for their hair, and Corientes goats for their skins, which are used in making shoes.

* * * * *

Keep a close watch on the fall colts. See that they get shelter during rainy days in the fall and early winter. The mother will be benefited by a ration of bran and oats which will also improve the colt.

* * * * *

Avoid letting the dairy cows go into winter quarters in anything but the best possible condition. A little attention at this season of the year in keeping them in proper condition, will be seen in the winter returns from the home dairy.

* * * * *

Don't stuff your animals with grain. Use the balanced ration in feeding. It is common sense feeding, and practiced universally by the best feeders. If you have not used the balanced ration begin at once.

* * * * *

Sheep have been rightly named, "the animals with the golden hoofs." They have aided many a farmer in paying off the mortgage on the "home place." Give them a chance and there is no animal on the farm that will rid it of weeds quicker than they.

* * * * *

A PROPER CLASS OF PORK.

In a recent address before the Iowa Swine Breeders Association, Professor Charles F. Curtiss, Director of the Iowa experiment station, discussed the class of pork which is coming into demand. He said:

"The 1,800 pound bullock and the 200 pound wether have disappeared from our markets, and the over-fattened hog, with his extreme weight and waste, is no longer wanted. There are also other considerations besides the proportion of fat and lean. The tendency to push our hogs to early maturity by extreme forcing and selection for the form giving excessive obestiy has also a tendency to soften tissues and a more flabby sided carcass than can be combined with superior quality of the finished product. Fine grain, firmness of texture and a comparatively even distribution of fat and lean are the prime essentials in high class pork products. These are the result, first, of heredity, and, second, of judicious feeding of wholesome feed products, succulent feeds, grass and abundant exercise.

"It is not to be expected that our country will in the near future, if ever, take rank with Denmark and Canada in the competition for the higher grades of bacon on the foreign markets, but the demand for better pork products for our home and foreign markets has already manifested itself in such a way as to command the attention of the farmer and producer. The change will undoubtedly come as a result of the modification of the type of our present popular breeds rather than through supplanting them with foreign breeds of the bacon type, although there is already a rapidly growing demand for hogs of greater activity, vitality and vigor and more prolific qualities, and a firm of packers in this state has recently imported several hundred head of an English bacon type and distributed them among their customers for breeding stock."

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INTERNATIONAL LIVE STOCK EXPOSITION.

A most highly interesting and instructive innovation this year at the International Live Stock Exposition, to be held at the Union Stock Yards, Chicago, November 29 to December 6, will be the admission of farmers' sons into the students' judging contest. The donors of the premiums for this year's contest, Messrs. Spooner, Clay and Sanders, have specially specified that the contest be left open to all farmers' sons, regardless of their belonging to any agricultural college.

This will give the colleges an opportunity to prove up their teachings, and boys who are not able to take the time for schooling will have an opportunity to become a part of this educational feast. It will hardly be expected that any recognized, first-class school will, under these circumstances, fail to enter the lists, as the schools would better look to their laurels in such a contest. Fathers whose boys have not attended this exposition should not allow anything to prevent the boys from going this year to watch this event, so as to prepare themselves for subsequent contests, as undoubtedly at future expositions this feature will remain a fixture. In addition to its being a pleasure to send the boys, fathers should consider it a bounden duty to give them the benefit of this week's live stock education and the man who farms and is not a student and striving to improve and put his place on a better footing each year, will not be a success.

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Water for Hogs.

There seem to be very few farmers who think that the hogs require any water at all, says the Farmer's Guide. Especially is this true if the animals are in the habit of being fed some kind of slop once or twice a day. This, however, comes far from being the right conception of things, for it matters little how much slop or wet feed the hogs may be accustomed to, they should have water just the same. They require good pure water not only once or twice a day, but at all times of the day. It should be standing where they may get it at any time they wish it. Hogs are the same as any other animals; they need plenty of water and will not do well without it. Water supplies a need in their digestive functions and throughout the body system that no other liquid has been found to give. For this reason we should endeavor to give our stock free access to good, fresh water all the time. To do this, more or less expense must be incurred, but we will always be sure to find it pays in the end. The lots and pastures should be so arranged that water in a trough may be had at all times. If this cannot be accomplished the stock should be allowed to return to the barn, or some other central place, at will for water. All this is especially important and valuable during the hotter months of the year. The same precaution, however, should not be overlooked in the spring, fall or even winter seasons. Water freely given to all classes of live stock will serve to keep them healthier and in better order than any other element of food or care.

An Ideal Flock.

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Director Jas. W. Wilson of the South Dakota Experiment Station: "Successful Farming has the appearance of a very useful sheet and contains a great deal of practical information which is of benefit to the farmers.

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SHETLAND PONIES.

There is a very striking illustration of the effects of climate, soil and feed in diversifying animal life, in the case of the Shetland ponies and the massive Shire or Clydesdale horses. They have a common ancestry, but the different environments, feed and conditions of life account for the wide diversity in development. The Shetlands are becoming quite common in this country, especially in the cities, where they are used by the children. They will gradually gain in size under the milder conditions of existence than in their native land.

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WEEDING OUT.

The Illinois experiment station has just completed a practical experiment in keeping the records of two ordinary dairy cows for one milking period. An accurate record was kept of the food consumed and the milk and butter fat produced. The animals were fed the same ration and treated alike in every respect. One consumed

6,478 pounds digestible dry matter and produced 11,329 pounds milk and 565 pounds butter; the other consumed 6,189 pounds dry matter and produced 7,759 pounds milk and 229 pounds butter. Placing the cows on the same feed basis, the difference in the value of the butter produced was $47.09. The practical suggestions derived from the above experiment emphasizes again the need of keeping close watch of the herd and weeding out unprofitable cows.

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SELECTION OF BROOD SOWS.

In selecting a brood sow, it is best to make the choice from a good sized litter. The cow should have a long body, plenty of teats, a level back, straight, short legs, fine hair and a quiet disposition. This last trait may be observed in a young sow by catching and holding her.

Too much emphasis cannot be placed on the importance of having the sow so gentle that at farrowing time she will allow the attendant to enter the pen if necessary. Sows should not farrow before reaching the age of one year, nor boars be used before attaining the age of ten months, though many breeds will mate earlier if permitted to do so. It is a common mistake to breed hogs when they are too young. First litters are not usually as good as succeeding ones, and 2-year-old sows are better than younger ones.

A first-class brood sow should be profitable for a number of years—six or seven in some cases.

A few weeks before farrowing time the sow should be put by herself and fed on slops, oats, chop, bran or any laxative food; no corn should be given at this time. The pigs should suck about six weeks; the sow should raise only two litters a year, or possibly five litters in two years.

* * * * *

A PRACTICAL EXPERIMENT.

On August 11, the Iowa station started an experiment to test the value of soft corn versus mature corn in fattening steers. Two lots of steers as nearly equall in weight, quality and breeding as was possible to pick, were selected. Lot No. 1 contained eight steers that were given the run of a seven acre pasture of blue grass, and fed in addition a ration of shelled corn from the crop of 1900.

Lot No. 2 contained eight steers that were placed under the same conditions as lot No. 1 with the exception of their ration consisting of green corn, cut fresh every night. They were fed stalks, ears and all. Samples of the green corn were analyzed in the chemical laboratory at the end of every seven days. The weekly gain of the cattle was taken. To determine the approximate yield of green corn feed a corresponding area of corn was left standing. This will afford a comparison of the aproximate amount of corn consumed by lot No. 1 and lot No. 2.

Lot No. 1 are to be fed on old corn until ready for market in December.

Lot No. 2 will be fed on new corn, a large percentage of which has been damaged by early frosts throughout the state. The work taken up is practical and the outcome of the experiment will be looked for with interest by the cattle feeders of the middle west, who are debating what is best to do with their soft corn.

HOG FEEDING.

The results of a swine feeding experiment, bulletin No. 65, has been reported by the Iowa Station. The experiment was to determine the value of beef meal, Armour's tankage, Swift's digester tankage and Standard Stock Food, when fed in conjunction with corn meal for economical production of pork. Thirty cross-bred pigs from six to seven months old were divided into five lots of six each and feeding was carried on for a period of forty-nine days. Following is the summary made by the experimenters:

The matter contained in this bulletin is the result of but one test and may be modified by future tests. The data obtained by this experiment would indicate:

1. That in the fattening of young hogs, a ration containing more protein and ash than a corn ration gave better results than a sole corn ration.
2. That a ration consisting of five parts corn and one part Swift's tankage yielded over twenty-two per cent greater net profits than a ration of corn alone.
3. That a ration consisting of five parts corn and one part Darling's beef meal yielded over twenty-two per cent greater net profits than a ration of corn alone.
4. That a ration of corn and Standard Stock Food yielded over ten per cent greater net profit than a ration of corn alone.
5. That a ration consisting of five parts corn and one part Armour's tankage yielded over seven per cent greater net profits than a ration of corn alone.

* * * * *

In 1872, the first movement of Texas cattle northward commenced. John Hitson, Iliff and others rounding up thousands of them in Texas (we would call it stealing now), and driving them up into Colorado. Prices were $18 a head on the range. In 1857 they commenced moving up into Wyoming and prices moved up some. The "round-ups" in Texas continued until this time when the cattlemen of Texas organized and drove these freebooters out of the state and out of business. The severe winter of 1880 and 1881 destroyed fully 60 per cent of the cattle on the ranges. About this time great cattle companies were formed in England and Scotland by men who had more money than brains and experience and they stocked up great ranges in Colorado, Wyoming and New Mexico defending them with the Winchester rifle against all comers and run prices up to $40 per head range count, that is they bought the number that the books showed that the owner possessed, taking everything that had hair on. Then came the great break in cattle prices, the stockholders in these foreign companies lost their money and the great companies nearly all went out of business and the small ranch men took up the business and have generally run it since.

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WOULD "DAM THE HOGS," TOO.

"Tug Wilson," in the Ozark Mountain News, tells a good story about an ex-Kentucky colonel of the "Quality Folks" sort, whom he once met in western Kansas. "The colonel was an enthusiast on the irrigation scheme that was sweeping over Kanas at that time. He was so positive in his theories, and so high-tempered, that few people cared to disagree with him. One day as he was standing in front of the office talking with several friends, 'Pink' Barclay, that lives over on Snake Creek, came along, and, after shaking hands around, turned to the colonel and said: 'Colonel, I've got forty acres of land lying close to Snake creek that I want to irrigate and would like to ask your advice about it.' 'Very well, sah,' responded the colonel, 'My advice is, dam the creek.' 'I did do that,' said Pink, 'and cut a ditch down across the land, but I couldn't get rise enough.' 'Then I would dam the ditch, sah,' replied the colonel. 'That's just what I did do,' said Pink, 'but the hogs rooted holes in the banks. What would you do about that?' 'What would I do?' snorted the colonel; 'I would dam the hogs, sah! I would dam the hogs!'"

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A DAVID HARUM TRADE.

There is a citizen in New York who decided to treat himself to a horse and runabout. In every case he insisted upon knowing the attitude of the prospective purchase in relation to automobiles. "I don't want my neck broken daily," he would say.

There was a horse that suited him. "I can warrant him on the automobile question," said the Jersey farmer who owned him. "I will guarantee that he will pass a dozen an hour all day long and never look at one of them."

"Will you give me a written statement to that effect?"

"I will."

"The sale was made. For once a Jersey man had told the truth in a horse trade. The horse was blind.

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Our Experiment Stations

Devoted to a monthly review of the work being carried on by the Experiment Stations.

The experiment stations have become important factors in solving many perplexing problems, "down on the farm," that the average farmer has neither time nor money to solve Most of our stations are working along practical scientific lines; that is, they are combining practice with theory and in this way are doing much good.

The farmer who would be eminently successful in his work should get in touch with the station workers in his state. If he is not receiving the station bulletins he should send a request to the Director of the Station asking that his name be placed on the bulletin mailing list, then, all of the bulletins issued will be sent gratis, as soon as published. These experiments are carried on at the expense of the federal government, with the intention of benefiting the farmer.

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SILAGE STUDIES.

Bulletin 92 of the New Hampshire station, on "Silage Studies," by Prof. F. W. Morse, has just been received. The experiments contained in the bulletin cover a period of several years. The following phases of the questions involved in silage practices are considered: Differences between varieties in composition and feeding value, effect on composition of various quantities of seed per acre, the composition of the crop at different stages of growth, and the changes in composition of the fodder while in the silo. The following conclusions are drawn:

"Our results and those of other stations invariably agree that the best silage is obtained from corn that has nearly reached maturity, with ears fully formed and well filled. At this stage of growth, also, a corn plant has reached its maximum of food production. Varieties of corn should be selected which yield the largest crops at this stage, rather than those which produce large plants, but are yet immature at cutting time. This practice is already followed by many farmers, but should be by all. For New Hampshire a standard variety is the Leaming dent corn, while in those portions of the state with too short a season for that variety to reach the proper stage, the Sanford flint corn can be advantageously used.

"The sugar in the green fodder is practically all destroyed in the silo, and since it is most abundant in the corn planted in the early stages of early development, it is an additional argument for postponing cutting until the grain is full size and the sugars have changed largely to starch.

"The amount of seed per acre affects the yield of green fodder, and also its composition. A medium stand is essential for the best results in both quantity and quality.

"The practice of using a half bushel of seed per acre is good. In a favorable season, with plenty of fertilizer, more seed could be profitably used, but the tendency to inferiority in quality, especially in decreasing the protein and increasing the sugar and fiber, render it, as a rule, inadvisable."

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SWEET POTATOES.

The Arkansas station has just issued a bulletin on "Sweet Potato Experiments." The bulletin contains much valuable information in reference to the growing and storing of sweet potatoes. During the past four years a large number of varities of potatoes have been grown. The yield has been from 40 to 402 bushels per acre on soil producing from 40 to 50 bu of corn, and 12 to 16 bu of wheat per acre. 4.8 bushels more per acre of sweet potatoes were obtained from large seed used in planting than where small seed were employed, but 9.8 bushels more per acre of merchantable potatoes. Cuttings were found to be equally as good as slips. Ridge and level culture were compared, covering a period of two years. The highest total yield and the highest yield of merchantable potatoes were secured from ridge planting, where the ridges were 3 inches in height. These also gave less culls. The expense of growing any crop was lessened by thorough preparation before the crop was planted. Cultivation should cease after it interferred with the growth of the vines. Prof. Newman in experimenting with the keeping of sweet potatoes says: "That if corn, or other grain is stored in bulk before it has thoroughly cured, it is sure to be damaged to a more or less extent, and frequently becomes unfit for use. In the process of curing, the grain undergoes what is usually termed, the "heating process' or "sweat," when it gives off its surplus water, and to a more or less extent undergoes chemical changes

Potatoes undergo a like process when dug, and it is at this stage that decay is most liable to attack them if the temparature and the moisture of the surrounding area is not as it should be. Stored potatoes should be kept at a temperature, not more than 60 nor less than 50 degrees, and should never become colder than the air that surrounds them, since this causes moisture to develop on the potatoes—a condition most favorable to rot.

A number of lots of potatoes were selected as soon as dug and treated in various ways with the hope of checking the tendency to rot. Each lot consisted of about one bushel of potatoes of uniform size, there being the same number in each lot. No attempt to store within three to five days after digging was successful The following table gives the methods of treatment and the percentage of sound potatoes ten weeks after they were dug:

Method of Treatment.	Per Cent. of sound potatoes.
Not treated (average 5 lots)	61
Packed in dry sand	54
Packed in wood ashes	14
Packed in road dust	38
Packed in air slacked lime	58
Rolled in flowers of sulphur	64
Rolled in powd. sulp. copper	68
Rolled in air slacked lime	60
Immersed 30 min. in Bordeau mix.	44
Immersed 30 min. in solution sulphate of copper	68
Immersed 30 min. in formalin (1 pt. to 30 gal. water)	66
Immersed 30 min. in formalin (1 pt. to 40 gal. water)	52
Immersed 30 min. in formalin (1 pt. to 50 gal. water)	58
Immersed 30 min. in amonia and sulphate of copper	72

Five other lots selected as above were heated for eight days in a well ventilated room to temperatures varying from 100 to 130 degrees F., and then stored in cellar with the others mentioned above. Very few of them were in bad condition ten weeks after dug, and these few had probably begun to rot before being placed in the drying room. The following table gives the per cent of sound potatoes in each lot ten weeks after they were dug:

Artificial heat (100 to 130 deg. F. for 8 days).....98 per cent.
Artificial heat (100 to 130 deg. F. for 8 days).....94 per cent.
Artificial neat (100 to 130 deg. F. for 8 days).....96 per cent.
Artificial heat (100 to 130 deg. F. for 8 days).....98 per cent.
Artificial heat (100 to 130 deg. F. for 8 days,.....98 per cent.
Average, 5 lots.....96.8

Of the methods tried for the prevention of rot none proved successful when the potatoes were stored before thoroughly drying or before they had undergone the sweating or curing process.

It is important that sweet potatoes be ripe when dug if they are intended for storing. This may be determined by breaking or cutting several and leaving them exposed to the air for an hour or two. If the cut surface turns black or greenish black they are not ripe. If the cut surface dries white or very nearly the same color as when freshly cut, they are ripe, and may be safely dug, cured and stored. Some growers are careful to dig before the vines have been injured by frost, while others delay in digging until after frost. The main objection to the latter plan is that frosts are usually preceeded by rain, and too great a time may elapse before the soil has sufficiently dried to permit digging. If dug when the soil is too wet, earth will adhere to the potatoes and this not only injures them for market, but makes them more difficult to keep. The soil should be dry when the digging is done, and if the potatoes are to be cured by artificial heat they may be taken at once from the field to the drying room. If not to be dried by artificial heat it is important that they be kept at a uniform temperature, and well ventilated, that the water which evaporates from them may readily pass off. After sweet potatoes have become thoroughly cured, they keep well if kept thoroughly dry at all times and stored where a temperature of 55 or 60 degrees F. is maintained. If these conditions were maintained it is immaterial whether they are stored in mounds, cellars, or especially constructed houses, and the method of storing must be determined by the convenience of the grower."

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Prof. Willett Hayes, Agriculturrist of the Minnesota Experiment Station: "I have looked over your first number of "Successful Farming" and am pleased with it. I note that your idea is to use material from men who are experimenting, and I note with interest that farmers the country over are taking much more stock in the work of men who are carefully studying these problems from the scientific, as well as from the practical standpoint.
I wish you abundant success."

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The staff of our experiment stations will soon be busy with institutes. Try and meet them and get acquainted. It may help you, we are sure it will help them.

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The Colorado station has in press a bulletin on "Swine Feeding in Colorado," which will report trials with beets and beet pulp in hog feeding, and also a bulletin in preparation entitled "Lamb Feeding Experiments 1901-1902."

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APPLE POMACE.

The Vermont Experiment Station has just published the results of a four year's experiment in feeding apple pomace to cows.

The station affirms that apple pomace is nearly the equivalent, if not, indeed, quite equivalent, to corn silage in feeding mick cows. The pomace was ensilaged the same as corn. The cows ate the pomace feed with avidity, no bad effects were noted in the flavor or yield of milk and butter.

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CANTELOUPES.

Bulletin 57 of the Georgia experiment station just issued treats of "Canteloupe Culture in Georgia." The bulletin contains a comprehensive discussion on the best methods to pursue in growing cantaloupes in Georgia for profit. The variety grown is the "Rocky Ford." The plant thrives best upon a warm sandy loam soil. Tables showing proper fertilizer formulae are given. Only the best selected seed should be sown, plenty of seed should be used, at least ten to fifteen to a hill. The plants should be thinned to one in a hill. Experience goes to show that upon the proper grading and packing largely depends the profit to be derived from cantaloupe culture.

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THE ROTTING OF APPLES AND ITS CONTROL.

In Bulletin No. 93 of the New Hampshire Experiment Station, Dr. H. H. Lawson reports an experiment in the best methods for the controlling of rot in apples. The chief points shown in the invesigation were the comparisons drawn between the efficiency of commercial cold storage, with conditions more nearly like those found in all ordinary cellars, and the effect of wrapping the apples.

Baldwin apples were packed in bushel boxes, about half the apples were wrapped in paper, the packages were stored in a Boston cold storage warehouse at a temperature of 34 degrees Fahr. One box each month was drawn from the cold storage and the amount of decay noted and compared with the conditions of similar boxes of apples stored in the cold storage, where the temperature ranged from 40 to 45 degrees during the winter months, and from 5 to 50 degrees during the early spring months. Apples returned in January after two months in the Boston storage showed little or no decay, while those in the station storage showed distinctly more.

In March and April the Boston apples showed 20 to 35 per cent more sound ones than those stored at the station and the 1st of June 60 to 70 per cent more. August 1st 48 per cent of the Boston aples were sound and none at the station. The indications were that the lower temperature did not injure the keeping quality of the apples after they were returned to a higher temperature. With regard to the wrapping of the apples, the results during the earlier months were not uniform, there being a small percentage in some cases in favor of the wrapped apples, in others in favor of the unwrapped; but in the later months and especially at the higher temperatures there was uniformly a percentage in favor of the wrapped, the percentage ranging from 6 to 40. The indications are that for long keeping, wrapping is of decided advantage. Light and heavy waxed paper, tissue paper and newspaper were used for wrapping, and there was but little difference in their effectiveness, newspaper being practically as effective as the more expensive kinds.

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CUTTING ALFALFA.

In a press bulletin issued by the Colorado experiment station, entitled, "The Best Time to Cut Alfalfa," Professor W. H. Headden says:

"There is a very generally accepted notion that there is a considerable difference in the value of the respective cuttings of alfalfa for feeding purposes, the third receiving the preference for milch cows, especially if it was made without the plants having been touched by frost, the first and third for sheep feeding, and so on. That there should be a diversity of opinion is quite natural, and a generally prevailing notion among intelligent persons, whose financial interests are touched by their daily practice, is usually based upon something more definite than their notions. But the judgment of individuals is almost as varying in regard to this as one can well imagine its being on any possible subject, and the testimony of the people when taken individually leaves one in a quandary as to whether they are not nearly all equally good. The more explicit question as to the best time or stage of development of the plant to cut it for hay is the one which is most often raised without special reference to the first, second or third cutting. It is this question that I shall try to answer, somewhat fully for the first, and more briefly for the second.

"There are two means of investigating this su ject. The first is by the study of the chemical composition of the plant, the second by feeding experiments. Both methods have been employed, but the series of experiments in feeding have not been so extensive as is desirable and the results so far obtained justify tentative conclusion only."

In referring to the work done by the Utah station the writer continues: "The conclusions reached by Mr. Mills of the Utah station as the results of feeding experiments are that the most rapid gains are made on alfalfa cut just before the blossoms appeared, and the least gain on such as is cut a week after full bloom. The hay cut at the intermediate period of full bloom is better than the latter, but quite inferior to the former. Mr. Mills represents the gains as 100 for hay cut before bloom, 77 for hay cut at full bloom, and 68 for hay cut one week later. The two earlier cuttings were eaten more readily than the latest cutting. He further states that, pound for pound, the value of the cuttings stands as follows: Before bloom, 100; full bloom, 78; and one week after bloom, 81." Continuing the professor says: "We would therefore answer the question in so far as it pertains to the first cutting that the best time to cut alfalfa is at the period of full bloom, for at this period we not only get the largest amount of hay, but also the largest return in pounds of beef per acre.

"The results of feeding experiments with the second cutting lead to the conclusion that the best time to cut this crop is what Mr. Mills designated as his medium cut.

"I conclude that, after allowing for a little latitude in the use of the terms half bloom, late bloom, etc., that the time to cut alfalfa in order to get the greatest value per acre is at the period of full bloom, and that there is a period of about a week during which its value is essentially constant."

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COLLECTING AND PLANTING FOREST TREE SEED.

The Bureau of Forestry at Washington, has a number of men in the field collecting seed from the forests, in view of extensive planting to be done in several localities this coming winter and next spring. Through the Forest and Water Association of Los Angeles county, California, there has been collected over one hundred pounds of seed from the Punis attenuata, in the Bureau of Forestry one of its agents has collected a large quantity of Sugar Pine and Incense Cedar seed, all of which will be planted during the coming winter on the denuded portions of the San Gabriel and San Bernardino mountains in Southern California. A deep interest is shown in this forest planting by the people of that section of the country. A quantity of pine and cedar seed will be used for experimental planting in the open parks of the San Francisco forest reserve Arizona.

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Quantities of Pinus ponderosa seed are being collected in the Black Hills of South Dakota, and the New Mexican Rockies, for planting on the Dismal River forest reserve in Nebraska. Red juniper seed to be used in the same way are to be obtained from the Platte river region, and the Jack pine seed from central Minnesota. Conifer seed from Mexico will be planted in the drier portions of southwestern Kansas and Oklahoma. Thus will be seen that a strenuous effort is being made by the federal government to develop the planting of forests in the west.

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MACARONI WHEAT.

For a number of years past the United States Department of Agriculture has been investigating the growing of macaroni wheat, with the idea of promoting the wheat industry in this country. Experts from the department have had this work under their care for nearly three years. A large amount of seed has been imported from Russia, Algeria and Argentina, and a number of varieties have been found that are well adapted for cultivation in our Great Plain region.

Farmers in the west have become much interested in this work especially in North and South Dakota, where the acreage is increasing from year to year. The manufacture of this class of grain into semolina and from it the manufacture of the various forms of macaroni is not well understood by our millers. Bulletin No. 20 issued by the Bureau of Plant Industry, contains a valuable report on the "Manufacture of Semolina and Macaroni," as carried on in France. The report is made by Robert P. Skinner. Counsel General at Marseille, France. The writer says that although one of the greatest wheat growing nations of the world, France is prevented, because

of its soil and climate, from producing the grain essential to the life of this industry, and the United States, the greatest of all wheat growing countries, has yet to send its first pound of macaroni wheat to the French market for manufacturing purposes. The wheat growing farmers of the United States should be urged to further specialize their business, first, as a means of engaging in the Mediterranean trade; second, in order that there may be built up in the United States a demand for the food products which may be had in all their excellence, after a sufficient supply of durum wheat has been produced. The so-called "hard wheat" of the United States is not at all the hard wheat of Europe, and somolina now being manufactured in a small way in the United States from the native wheat, while a worthy product, is not acceptable in the foreign markets as a competitor with the semolina of first quality, found in local manufacture.

If the average person should be asked whence macaroni comes, he would answer immediately "from Italy." At one time this was true, and it arose from the fact that the native wheat of Sicily and that southern portion of Italy known as La Poulle possessed all the attributes deemed desirable in the typical macaroni grain. The industry had its birth in Naples, and the reputation of the Neapolitan manufacturers rests today mainly upon the fact that they had this wheat with which to work. In the course of years the Italians have neglected the cultivation of the grain, many wheat fields having been planted over with vines, so that now, commercially speaking, the hard wheat of Sicily and La Pouille is unimportant; nevertheless, its quality is as highly appreciated today as ever, and modern farming in Algeria owes much to the lessons learned from Sicily. With the growth in their business and the decrease in their supply of the home grown grain, the Italian manufacturers looked elsewhere for their supply of raw material, and they turned naturally to Marseille, a city where capital and business enterprise abounded. The Marseillais, always great manufacturers and exporters of flour, rapidly grasped the situation, began to import durum wheat from Russia and Algeria, ground it into coarse flour—which we call "granulated flour" or "semolina," or in French "semoule"—and sold it to the Italians. The exports of this product from Marseille to Italy last year amounted to 3,510,111 pounds.

It was but a step from this starting point to the manufacture of the macaroni itself; and one improvement following another, and, the public demand for macaroni and other edible pastes rapidly increasing, they established large factories alongside their mills, and exportation began to all parts of the world, even to Italy itself. With the introduction of the Budapest roller process of grinding flour, the business expanded upon modern lines; and, whereas years ago every Italian family made its own macaroni and hung it out on the racks to dry, the manufacture has now become an industry of first rate importance, requiring capital and enterprise.

Unquestionably the growing of macaroni wheat in this country will become an important and profitable industry. The total import of macaroni into the United States for the year ending June 30, 1901, was 18,186,399.83 pounds, valued at $735,239.49. The estimate of the durum wheat yield in this country for this year has been placed at one million bushels.

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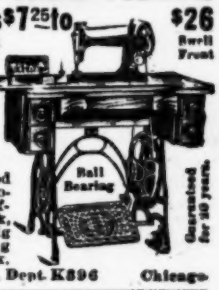

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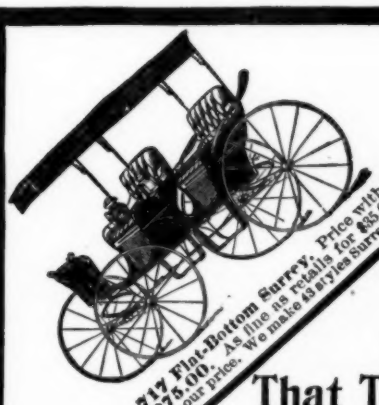

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IN THE DAIRY

Contributions invited and inquiries answered.

Neatness of package is important in selling butter.

* * * * *

To show results at the milk pail, the dairy cow must be a hearty eater.

* * * * *

Butter that has been properly made will not stick to the knife blade when it is cut.

* * * * *

The cause of white specks in butter, in most cases, is due from over souring of the cream.

* * * * *

In selecting future dairy cows from heifers, see that the milking organs are well developed.

* * * * *

The dairyman who looks after the comfort of his cows will get the most out of them. He will lessen the cost of milk production, which is the same thing as increase in price.

* * * * *

A poor dairy cow takes up as much room as a good one and will cost as much if not more to keep. Weed out the poor cows—the Babcock test will do it

* * * * *

Take time, each day, to go along in front of the mangers and notice whether each cow has eaten her feed up clean. It will aid in furnishing the proper quantity and quality of rations.

* * * * *

SELECTING DAIRY COWS.

THE "HIT AND miss" method won't work to a profit in the selection of farm stock for specific purposes. Most noticeable is this fact in reference to the dairy cow. The economical production of large quantities of milk high in percentage of butter fat indicates the value of the dairy cow along practical lines, aud in selecting dairy cows for the home herd this first consideration should be uppermost. The points of importance indicating production of milk. may be said to consist: 1st, of a good constitution, by the means of which the dairy cow is enabled to stand long service in feeding and milking. The indications of a proper constitution are, deep chest, good heart girth and general appearance of vigor aud good health; added to this in order to bring about the production of a large yield There should be a wide muzzle, a comparatively open backbone which readily distinguishes the dairy from the beef type, the latter being close and compact (necessary for proper beef production.) The dairy cow should have a large barrel or belly for theproper digestion of feed, and a well shaped udder, wide from side to side, extending well forward, well backward a'so and high up between the thighs, with prominent milk veins leading forward into large socalled wells." In the breeding of a dairy herd aim to breed from cows of known capacity and from bulls whose dams have been tested and their value as dairy cows fully established.

From testing, the best milking cows are found out, and it is wonderful how animals are discovered to be good milkers, when a whole twelvemonth is taken, which yet have never yielded a very large quantity at one time, while, on the other hand, animals which have yielded an enormous quantity over a short time and have had great notice taken of them are really poor milkers when their total yield for twelve months is summed up. The cow that yields a moderate quantity over nine, ten or eleven months is the sort to have to breed from, and it is only by a record that this is found out. In addition to this, the quality of the milk must be taken into account, and it is desirable to test this from time to time also.

Two Profitable Guernsey Cows, selected with Care.

* * * * *

A TEST FOR GOOD BUTTER.

The good housewife who said, "The way to test good butter is to smell it," was surely an expert judge of butter. The fact is that a really good judge of butter seldom tastes it, but depends rather upon the senses of smell and sight. The dealer who really knows and deals in good butter can at any time when he is tasting a crock or roll of butter, be seen to very carefully pass it in review before his olfactory nerve, and to break it and note the appearance of the broken surfaces.

The true flavor of butter can be quickly tested in the entirety of a package in this manner, while if the senses of taste alone were depended upon and the package was not of even quality, the fact might go unnoticed. The quantity of salt in the butter can, of course, only be determined by tasting it. The surface exposed when a package or sample of butter is broken should exhibit what is known as a good grain. That means that it should have a clearly defined granular surface, similar to that found on the broken surface of castiron of good quality. Do not fail to apply these tests when passing judgment on the quality of butter. Their careful observance and a little practice will make you an expert.

* * * * *

The Value of a Dairy Record.

My friend, do you keep a dairy record? Do you know when your cows come in, and when they are due to calve again? Do you know how many pounds of milk each cow produces in a year? Do you know how much each cow's milk tests, and how much butter each will give you? If you know this, you are able to tell very nearly how much your income is from each cow, and how much profit she gives you over the cost of keep. You will likely be surprised to find that your profits from individual cows run all the way from $40 down to nothing and less than nothing, and I shall be surprised if you do not

The value of a cow, I take it, depends almost entirely on the amount of butter she produces. Suppose a cow produces 500 pounds of butter in a year, which nets from the factory 20 cents per pound, giving an income of $100. If we allow $40 for feed, we have a clear profit of $60, which will pay 20 per cent interest on an investment of $300. Do you not think as goop a cow as that is worth $300 to keep for a milker and breeder? A 400-pound cow is worth $200; a 300-pound cow, $100; a 250-pound cow, $50; a 225-pound cow, $25; a 210-pound cow, $10, while a 200-pound cow would just about pay her board, and would just be worth taking as a gift Now, suppose a cow will only produce 150 pounds of burter (there are lots of cows like that), you sustain a loss of $10 every year you keep her, and should you buy such a cow to keep for five years. you ought to get her for a present, and in addition she should have a fifty-dollar bill pinned to each ear, and even then your bargain would be a poor one, because this cow would take up the room of one that would give you a good profit.—Hoard's Dairyman

* * * * *

WHY MILK TESTS VARY.

"What is the reason of our milk test being 2.6 per cent one month and next, under exactly the same conditions, it tests 4 per cent or more?"

There are a great many things that affect the test, so that we cannot point to any one thing as doing it. In the first place, the conditions are never exactly the same; the pasture may be better one month than another, the weather may be cooler or warmer. perhaps you encourage your cows less with the milk stool, or perhaps the boy who brings them in does not get them so much excited. All these things, and many more, influence the per cent of butter fat.

Kindness is sure to be rewarded by an increase in both the milk per cent of butter fat and also in the milk yield; whenever you abuse the cow, either by a sharp word, the milk stool, or by running her, you are taking money out of your pocket by decreas-

ing the per cent of butter fat and also the yield of milk. Whenever the cow suffers for lack of food, water or lack of proper care, there is a decrease in the amount received from her

There are other reasons why your test may be lower one month than another. When the milk is warm it churns very easily, so that, when you send your milk to the station in cans only half full they will be partially churned when they get there. There is no way of getting a fair sample of such milk, for the butter fat that is churned is lost both to the patron and to the creamery man. If you have a can and a half to send fill one can full so that you can be sure to have that much that will not be churned. Keep the milk as cool as possible, so it does not churn so readily at a low temperature.

If you do not want low tests do not take the first milk himself, and let the calf have the last. The first milk often tests as low as one-half of 1 per cent. while the last will test from 10 to 12 per cent. Do not skim all your milk before you send it to the station and then expect it to test 6 per cent.

To the creamery man I would say, keep all samples of milk from churning, if possible; good tests can never be obtained from a churned sample without the use of ether, and this is too laborious a process for you. It is claimed by some that simply heating the milk to a temperature that will melt butter fat will answer, but my work in this line convinces me that satisfactory results can never be obtained in this manner.

J. A. CONOVER,
Kansas Experiment Station.

* * * * *

REARING CALVES ON MILK SUBSTITUTES.

The Pennsylvania State College has been conducting an experiment recently on the raising of calves on milk substitutes. The results of the experiment is told in Bulletin No. 60 from that station. The greatest importance attached to the experiment is in its value to dairymen, who supply milk to the city trade. It is often advisable to keep the heifer calves coming from a high class herd of milk producers.

Owing to the delicate nature of the digestive tract of the calf there is no complete substitute for milk, during the first ten days after birth. The milk provided at that time is not fit for the market and can best be used to feed the calves. After this period is passed there is a demand for a milk substitute, and by skillful management calves may be raised to a profit.

The author cites the English method of raising calves, on calf meals used as substitutes for milk. The practice is largely employed by calf feeders in England, either purchased as stock foods or mixed by the farmers themselves. The following mixture was made up by the station and proved quite satisfactory:

Wheat flour	30 pounds
Cocoanut meal	25 pounds
Nutrium	20 pounds
Linseed meal	10 pounds
Dried blood	2 pounds

One pound of the mixed meal was added to six pounds of hot water, and, after stirring for a few moments, allowed to cool down to 100 degrees F., when it was fed, either out of a pail or from a calf-feeder. The advantages of a calf-feeder are that the calf, sucking the rubber teat at the bottom of the feeder, is certain to get all the meal which settles at the bottom of the vessel. In drinking from a pail, this part of the ration is most apt to be left uneaten. Again, by taking its food from a calf-feeder, perhaps it is better mixed with the digestive juices, thus insuring an easier digestion and a more complete assimilation than when the calf drinks from a pail. When the calf was from seven to ten days old it was fed a ration twice a day consisting of three pounds of whole milk and one-half pound of the calf meal mixed with water, as above described. This ration was fed for from four to seven days, depending upon how the calf thrived, and then it was put upon a complete ration of calf meal.

The wheat flour serves to keep the bowels from becoming too loose, besides furnishing considerable nourishment. Only high grade flour was used, obtained by taking wheat grown on the station farm to the mill. It is believed, however, that a low grade flour would answer every purpose, besides being much cheaper.

Cocoanut meal is a by product in the manufacture of cocoanut oil. Nutrium is a soluble skim-milk powder and is manufactured by drying skim milk a a comparatively low temperature and by a peculiar agitation. The properties of linseed meal are well known. Dried blood is a product of the large abattoirs. The average cost of the calf meal is estimated as follows:

Flour	2 cents per pound
Cocoanut meal	1½ cents per pound
Nutrium	10 cents per pound
Linseed meal	1½ cents per pound
Dried blood	3 cents per pound

At these prices the cost of a pound of calf-meal is 3.2 cents. By using second grade flour and the granular nutrium it is possible to reduce the cost to a little below three cents per pound.

For the first five or six weeks the calf does not need more than two pounds of meal per day, and after that time two and a half will suffice up to the time it is weaned. In other words, the calf will take on the average about two and one-fourth pounds of the meal per day from the time it is two week old up to the time of weaning, or for one hundred days. This would amount to a cost of about $7, exclusive of the grain, other than the calf meal, and hay the calf would eat up to weaning time, which would amount perhaps to nearly a dollar, and the milk drunk before being put upon the calf meal, which would bring the cost of the calf up to between eight and nine dollars at the weaning time or when it is about four months old.

The calf meal is not as satisfactory a food as whole milk for very young calves, and it is quite likely that for the first few weeks upon this ration the calf does not have the vigor or power of resistance that it would have if fed upon its natural food. As a consequence, calves that are to be raised upon a milk substitute should have provided for them warm and dry quarters that will keep the animal comfortable at all times. This feature of raising calves cannot be too strongly emphasized.

Prof. Hayward's conclusions are as follows:

From the results of these trials, the following conclusions seem warranted:

1. There is little difficulty in raising prime dairy calves without milk after they are two weeks old.

2. The cost of raising calves on a milk substitute, up to the time they can be put upon a hay and grain ration, or when they are between three and four months of age, need not exceed ten dollars ($10.00), exclusive of care.

3. Calves from high-class, well-bred dairy stock, when raised in this way, are worth much more than they cost, and afford the only means by which a milk dairyman can raise his herd to a high standard of excellence.

* * * * *

NEED OF GOOD MILKERS.

In the large dairy establishments that are supplying first class milk to the city trade there is great stress laid upon the employing of capable milkers. Milk companies, in advertising for help, emphasize the importance of applicants being good milkers. This same trouble is seen on the farm, where hired help is depended upon to do the milking. Many times valuable cows are ruined by reason of poor milkers. Mr. Valency Fuller, in the Jersey Advocate, has some good things to say about the importance of good milkers. He says:

Anyone who has had a large dairy herd knows how hard it is to get first-class milkers, who will draw the milk rapidly from the udder without hurting that delicate organ and yet get every drop the cow is capable of giving. The cow is a sensitive creature and requires to be handled in a very gentle manner, and no portion of her body is as sensitive as the udder. It is a great relief to the cow to have her over-distended udder relieved of the milk that is in it. How often have we stood in front of a cow who is being milked by a skilled and gentle milker (and no one unless he is gentle and sympathetic will ever make a good milker) and see the look of contentment which comes in the eyes of the cow; with half shut eyes and dreamy look she gladly yields up the lacteal fluid we ask from her. She is prepared to do her part by man, and she asks in return that man do his part by her, by drawing the milk quickly but gently, not by unnecessary tugging at the teats, but by gentle, rapid pressure, and with a downward movement of the fingers.

Good milkers are rare and they are a priceless blessing on any dairy farm. It goes without saying that the cow should be milked regularly, at the same hour each day, and always by the same milker. We all know that a change in the time of milking, or in the milker, means a decreased flow of milk until the cow becomes used to the ways of the new milker and there is a bond of sympathetic confidence established between him and the cow.

In the matter of feeding and handling, much loss often occurs from lack of appreciation of the wants and needs of each individual cow. A proper ration may be compounded, but the duty of the feeder does not end here. It is folly to say that cows can always be fed in proportion to their weight, or that all cows will do equally as well on a similar ration. Each cow has her own individual power of assimilation and taste, both of which must be considered and satisfied, if we expect her to do her best work and give us the greatest net profit. These will vary less when cows have all been reared and bred on the same farm, as what will best suit the appetites and will be best assimilated by the cows is largely a matter of training.

The writer has attained a slight measure of success in the handling and feeding of cows. He applies the laws as they affect the human race to the

cow, and has attained the best results by so doing. The cow is, after all, our mother, the great foster mother of us all. We should consider her as such, and treat her with the same kindness and consideration that a mother is entitled to at our hands. The writer tries to know each cow of the herd; to appreciate her wants and to supply them; to get at the peculiarities of each cow and cater to them; to establish a bond of sympathy between him and his cows. To say cows have no affection for and no memory of their attendants is all nonsense. The writer has seen many cases of both illustrated.

To make the greatest success of a herd, study the wants of each cow. Know such wants and supply them. Compound a ration that will best suit such wants and secure the greatest profit. Treat your own cows kindly and they will readily respond thereto. Curry them daily; it is healthful and beneficial to the cow. Do not expose them to inclement weather in winter, nor to the severe rays of the sun and heat of summer, without proper protection or shelter. Feed them regularly, at the same time each day. Have them milked at the same hour, by the same man, each day. Establish a bond of sympathetic friendship between you and your cows, and you will go a long way towards making them the most profitable bank account you can tie to.

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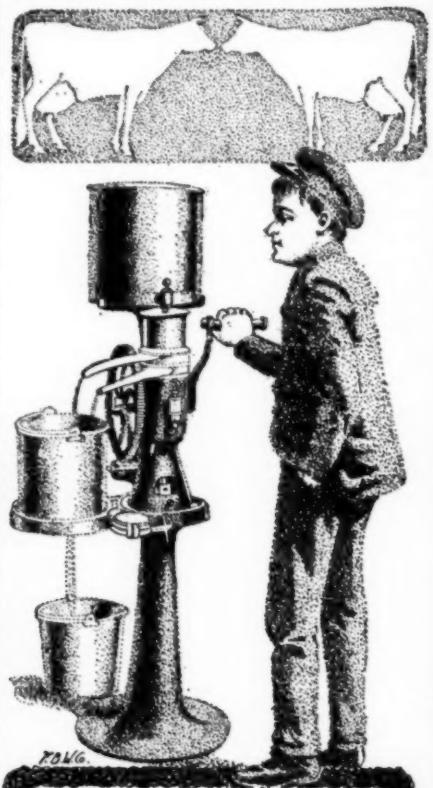

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Let's Get Acquainted.

My people have a good book about me and my brothers and sisters that's full of dairy common sense.

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Empire Cream Separator Company,

(*Formerly U. S. Butter Extractor Co.*)

BLOOMFIELD, N. J.

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...Horticulture...

Our readers are cordially invited to discuss through this department any matters pertaining to horticulture. Inquiries regarding fruits, vegetables and flowers cheerfully answered by specialists.

"Oh! Painter of the fruits and flowers,
We thank Thee for Thy wise design,
Whereby these human hands of ours,
In nature's garden work with Thine."

* * * * *

Store only sound fruit and vegetables in the cellar.

* * * * *

Ventilate the root cellar every morning during the early fall.

* * * * *

These are excellent days to start cuttings, to be used later in the window garden.

* * * * *

Modern cold storage is doing much good this fall, in helping the fruit growers market their perishable products.

* * * * *

"How the universal heart of man blesses flowers! They are wreathed round the cradle, the marriage altar, and the tomb."

* * * * *

Dig up the bare spots on the lawn and thoroughly fine the soil, sow grass seed and later on give the ground a light covering of manure. Next spring note results.

* * * * *

LOOKING AHEAD.

The success of next year's crop in the garden, will depend largely upon the fall preparations. Plowing and cultivating the garden at this season of the year will start many weed seeds to germinating, that will be killed later, by freezing.

The ground should be left as open as possible during the winter months so that the action of frost and sun will mellow the soil.

An excellent idea is to gather all rubbish, about the garden, into a heap thereby, permitting the pile to decay, causing a fermentation which will result in the destruction of many plant diseases and insect pests that are waiting for next spring to come in order that they may begin their ravages.

* * * * *

BLEACHING AND STORING CELERY.

When the celery plants have attained the proper size for use, the leaves are brought into an upright position by boards placed on either side of the rows, so that they slope toward the plants at the top, or else by dirt drawn against the plants and packed firmly around them. The object of this is to cause the leaves to take an upright position and exclude the light from the heart of the plant, so that the later growth becomes white or "bleached." The process of bleaching requires from two to four weeks, depending upon the variety and time of year.

After the bleaching process is carried as far as desired, the plants are dug for early celery. This may be in September or October, but the late crop should not be taken up until there is danger from freezing. The plants are usually removed from the rows with a spade or potato fork, and the decayed outer leaves cut off. They are then ready for storing. This may be done in a damp, cool cellar or in trenches outside. If in the cellar, the roots should be bedded in moist sand or earth, leaving the plants to stand upright. Boards should be put in every eight or ten inches apart to separate the plants and allow ventilation. When the crop is stored outside, trenches are dug eight inches wide and deep enough to allow the tops to be even with the surface of the ground. For a cover, nail two boards together, making a trough. Set this over the tops and spread on a light covering of hay. As cold weather increases cover with earth to avoid all possibility of freezing. If sound when stored, celery treated in this way should keep well until February or even later.

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PICKING AND PACKING APPLES FOR COLD STORAGE.

Every year we find many of our fruit growers sending large consignments of apples to the cold storage warehouses where they are held for the advance in market price which is sure to come after the usual market glut is over in the fall. It seems that a few points bearing on this subject would be quite apropos at this season of the year.

Attempt to store nothing but first-class fruit. Have barrels at hand and arrangements made for shipments before beginning to pick. Pick the crop as soon as it is grown and has its color. This is while it is still hard, two weeks before ripeness. Use no fruit that is not picked by hand. Sort carefully, throwing out all fruit that falls below the grade and all that is not absolutely sound. Choose good, well-colored specimens for the first layer of the barrel and place them all by hand, stems down. Do not crowd them. Place the second layer by hand either exactly, apple for apple, on the first or else turn them on their sides, blush down, breaking the joints of the first layer. After this pour in the fruit gently from the basket, first lowering the basket into the barrel. Shake the barrel frequently and fill it up, using the same grade and variety of apples every inch of the way. Pack the last layer of the barrel by hand, as evenly as possible, with the stems up. When this is in place apply the press, with a padded head, small enough to fit into the barrel, to settle the fruit. Release the pressure, place on the barrel head, force it into position, drive down the hoops and nail them solid. Turn the other end of the barrel up. Label on it plainly the variety and grade of the fruit and the name of the grower. There must be absolutely no movement of fruit in the barrel. Ship without delay to the storage house. Ship in the evening if possible. If the distance is great, or the connection poor, use refrigerator cars and see that they are iced several hours before putting in the fruit Go with the fruit if possible; if not, have your commission man apprised of the shipment and send him the bill of lading. Trust the commission man, but never lose track of the apples.

The man who attempts to carry apples through cold storage in a less painstaking way than this will never succeed. Unless the grower and shipper can clear his conscience by this standard he cannot wholly blame the warehouse men for his losses in storage. This kind of handling insures the minimum shrinkage in storage. In the storage houses of the Armour Packing company, Kansas City, during the season of 1900 and 1901 were thousands of barrels packed by apple speculators, the shrinkage on which averaged less than 2 per cent. In the same room were apples packed by farmers, some of which shrunk as high as 30 per cent. Now, they received exactly the same degree of temperature, dryness, etc., so that the fault was not with the storage room but with the quality of apples and the way in which they were packed.

Cold storage cannot improve the condition of fruit. At best it can only hold it at something near the condition it has when it is put in. It cannot save from decay fruit that is imperfect or unsound. A few decaying specimens soon ruin the whole barrel. Sound fruit is the only kind that will keep in cold storage.

* * * * *

SEEDING CHARACTER OF CONIFERS AND DECIDIOUS TREES.

That the so-called forest lands of America, that have been devastated by fires and the unscrupulous lumberman, can be reclaimed by the planting of seeds by man seems an almost Herculean task. The proper solution of the preservation of our annual supply of lumber consists, not so much in the reclaiming of these wasted lands, but in the protection of those forests that have not as yet been destroyed. This can be done by bringing the people of our nation to a realizing sense of the necessity of such a protection. The government still holds large tracts of land, especially in mountainous regions, that can be protected without infringing on the rights of individuals. Lumbermen are finding out that they need not destroy a forest in order to make it pay, that by the judicious selection, forests may be made a source of perpetual revenue to the owner.

But there are areas, here and there, outside of the strictly forest regions, some that have never been tree producing, others that have yielded once, but now are barren, that can be reclaimed by man. Such areas may be made to produce perpetual forests by the planting and raising of trees. If nature be left to do the work entirely the result will be an unevenly distributed growth. The high ground will be scantly covered, with drawfish growth, the wing seeds will be more widely distributed than the nuts, such as the acorn, the walnut and the hickory.

Besides letting nature do the work there are four methods of replanting forests. First, the seeds may be planted where it is intended that the trees should remain permanently. Second, trees may be transplanted from neighboring forests. Third, seedlings may be grown under glass or other shelter, if needed, and then transplanted. Fourth, seedlings may be purchased of nurserymen and transplanted where they are needed.

Oaks, hickory, walnuts, and chestnuts may be successfully grown by planting where they are intended to be permanent. This can be done by simply opening a furrow at proper depth, then drop the seeds, cover, and as seedlings appear, if too thick, then thin out. One objection to this is that the seeds are very likely to be destroyed by birds, mice, squirrels and insects. Maples, ashes, and small seeded plants will in many instances fail with such treatment. Conifers will entirely fail.

Transplanting from forests is practicable, but expensive. Expensive both because forests are often not near, and because trees are much more likely to fail than if taken from seed bed or nursery row. Purchasing seedlings from one who under-

34

stands the propagation and care of trees is a good method but is expensive.

With a little knowledge and care seedlings can be grown by the party who needs them. Such seedlings grown in proper seed beds will escape variations of temperature and destruction by mice, squirrels, insects, etc. The roots will not be destroyed in moving, and the trees will make a much more rapid growth. Many trees can be thus propagated in open air.

If nuts and acorns have been properly wintered, and kept from becoming dry and exposed to the action of frost, they are likely to make rapid growth. They require exposure to frosts to open shells and allow the germ and radicle to escape. Nuts can be spread on the ground and covered lightly with sand or boards to prevent the depredation of squirrels. Trees from which seeds are taken should be healthy, middle aged ones and a little separated from the rest. The seeds should be gathered in dry weather. If tested in water the sound ones will sink. If they are planted in the fall it should be soon after they are gathered. Care should be taken not to do this too early, for the acorn especially is likely to sprout. If the planting is intended to be done in the spring, the seeds should be dried thoroughly, placed in a cellar, and kept at a temperature of about 30 degrees above zero, in order that they may not sprout. For planting select land that is free from rocks to avoid hard digging; make the soil mellow and fertilize it well. The seeds should be placed three or four inches apart and two inches deep. The next spring take up the trees, cut back the top root, and reset. If transplanted often fibrous roots will be developed which are almost necessary to the life of the tree. They can be transplanted two and even three times.

The small seeds of conifers should be sown in drills a foot apart and firmly covered from one-fourth to one-half inches. For them select a spot where drainage is good and the soil will not wash, a sandy loam with a well worked mixture of decomposed muck, leaf mold, peat and old manure, is most favorable. When the seeds are sown in autumn, shutters or skylights are tilted when the weather is favorable so as to give beds air, this is best for germination. In spring the seedlings will require daily watching to prevent them from becoming dry. The cones of the white pine (Pinus strobus) should be collected in the fall. It is best to place them in a bag, in a cool, dry place and shake to remove the seeds from the scales. These should be sown in the spring in sandy loam not too rich. It is necessary to protect them from the direct rays of the sun. Moisten moderately and when the seedlings are two or three feet in height, they may be transplanted. There are three things to remember in regard to white pine: First, it does not grow in the richest soil; second, in transplanting, the roots must not become dry; and third, young trees should be shaded until fairly started. The terminal bud of this tree should never be cut. The young trees should be close together so as to kill the younger branches. The seeds of Juniper, Virginiana and a few others should be mixed with sand, allowed to freeze during the winter; but pines, spruces, etc., may be sown in early spring in cold frames, secure from frosts. The first three months are the critical times with such seedlings. They should be kept from the direct rays of the sun and the drying winds. Evergreens require a sand leaf mold and should be sown broadcast. They can be protected by portable latticed covers. In warm and moist weather seedlings can be protected from dampening by sprinkling with sand. Trees for spring planting should be removed from seed-beds in the fall, for they are then in their best condition. In planting the roots should be spread out and the soil worked among them. The tree should be inserted somewhat deeper than it stood before transplanting. For planting select a cloudy or rainy day. Evergreens are difficult to handle because fungi attack the embryo plant soon after its appearance above ground. For this reason they should be made to germinate in early season to avoid the fungus attacks. Beds may be shaded by green boughs or laths.

The seeds of the sugar maple ripen in October and should be planted when gathered in a protected place. When the seedlings become strong the protection may be removed. The box elder and ash bear their seeds in autumn and they should be planted at once, for they are very apt to dry. They can, however, be kept until the next spring by mixing with sand and the whole placed in a pit until February. Two bushels of sand for every bushels of seed is about the right proportion. The mixture should be stirred up frequently in order to prevent heating. It is best to soak boxelder seeds two weeks and ash seeds three or four weeks before planting. These seeds will do best in a sandy loam. Remove the plants at the end of the second year and plant at the distance of six inches apart in rows one and one-half feet apart. After another two years' growth they are ready for permanent planting which can be done in mild weather in spring or fall.

The seeds of red and soft maple and white and red elm ripen in June and should be planted at once. The method of treating seedlings is similar to that of the ash.

Downy winged seeds, such as the cottonwood are difficult to grow. It is best to let nature do the work and then transplant. These trees generally grow along river banks. The seeds are deposited along the banks where they sprout readily and grow rapidly. Here the planter can get them in abundance.

The so-called hard seeds, of which the honey locust and coffee bean are examples, retain their vitality for many years. They should be placed in a dry place. Their tough, horn-like covering requires soaking in water before it is ready for planting. It is best to do this soaking in the spring just before planting, which should be done in moist soil. They should be kept moist until they sprout. The growth of the seedlings is rapid.

H. W.

26 Bu. Baskets

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Dewey Victory	10 col.	Zinnias	12 col.
Hobson Choice	8 "	Sweet Williams	14 "
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Ten Weeks' Stock	12 "	Morning Glory	15 "
Sweet Alyssum	2 "	Forget-me-not	2 "
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Larkspur	6 "	Pinks	10 "
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GARDEN & ORCHARD

One great error in window gardening, consists in attempting to grow too many plants. One good plant well grown, and healthy, is worth a dozen sickly ones.

* * * * *

In the wind that flutters by,
All the fruit trees moan and sigh,
As if in woe;
"I don't wonder that they do,
I've been full of green fruit, too,"
Said little Joe.
—Dubuque Enterprise.

* * * * *

MAPLES AS SHADE TREES.

SOFT maples do not make good shade trees. When set along the border of walks or or drives, they branch out and give a good leaf surface, but the wood is of too soft a nature to withstand wind storms, the limbs being soft and brittle, break easily, and after heavy rains or wind storms it is not uncommon to see the ground about the trees strewn with branches. After the trees obtain the age of ten or twelve years the breaking of the larger limbs begin and as a result, the trees become badly disfigured and eventually the tree has to be removed. Think of the time lost in growing such trees, when if hard maples, elms or ash had been planted, permanent shade trees would have been obtained. The professor of Botany of the Ohio Agricultural Station says of them: "The soft maple as a street tree is short lived and consequently should not be planted where permanency is desired in a tree." The professor is "mighty right" in his deduction.

* * * * *

HOW PLANTS BREATH.

Many of our readers will be interested to know the way in which our growing plants breath and the important and interesting part leaves play in plant growth. The food which the plants receive from the atmosphere through its leaves is accomplished by means of minute openings called stomota, or mouths, which may be seen only by the aid of the microscope These openings are exceedingly numerous. It has been computed that as many as 100,000 are found on the lower surface of an average apple leaf.

These openings are also formed on the stems of young growing plants

Plants differ as to the number and size of these openings. These mouths or valves, as they may be called, not only serve as inlets for food, but outlets for gases and moisture, acting as breathing pores for the plant.

Through them into the plant comes the carbon in union with oxygen, making a compound known as carbonic acid gas. This substance soon separates. The oxygen escapes into the air, and the carbon remains in unite with water, sent up from the soil, thence converted into starch, sugar, cell walls, etc, which comprise a very large portion of the dry matter of the plant. The only substances that are obtained direct from the atmosphere through the leaves are carbon and oxygen, except, perhaps small traces of nitrogen in the form of ammonia gas, although this last point is not fully decided. When we stop to consider the amount of moisture sent out from the plants through these litt.e openings there importance may be seen at once.

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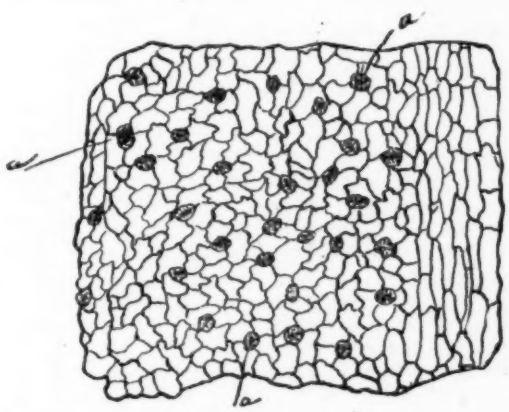
WINTER PRUNING.

Much may be done in the orchard in the winter. The culture of fruit promises to be, if it is not absolutely one of the most profitable employments of the farmer, but only for the thoughtful and industrious one. The too common idea that a tree may be planted and left to grow, without further care or attention, is wholly out of place under our present circumstances, when everything that is worth anything is to be cared for as if it were—as it really is—exposed to a great multitude of enemies and disasters. And just now, if the orchard is carefully surveyed, there will be many things found for the industrious hand to do

There is the pruning to be done. Every day this is delayed the vigor of the tree for profitable purposes is lessened by the divergence of nutriment to useless parts of it. All the excessive growth of the past year or years, should be taken away before it has absorbed the sap from the rest of the tree, where it is most wanted. In the majority of trees there is more useless wood, mere parasites on the strength of the tree, than there is of bearing and useful parts. From the sprouts at the roots to the topmost branch there is wood to be taken away, or the tree will not be profitably productive. One of the rules in this respect is that every branch or twig that crosses another should be taken out, so as to admit the light and air among the branches and leaves. This should be so, because the air affords the largest part of the nutriment to the tree and it is the leaves that take in this nutriment.

We are too apt to think that the roots are the feeding organs of the tree, but, on the contrary, they are but secondary in this respect, for the leaves take in from the air fully ninety-five per cent of the total substance of a tree, and the fruit is made up of the matter taken from the air to a still larger extent. The roots take in all the water used in the tree, but the leaves dispose of it, and it evaporates through them entirely, leaving behind it whatever it held in solution of the small quantity of mineral matter taken by the roots from the soil, of which the ashes of the wood will be the total measure. Thus we see how it is that the leaves should be constantly bathed in a full current of fresh air, that they may gather from it all the substance of which the sugar, the starch, the acid and the pulp of te fruits, and indeed, of the rest of the tree, most wholly consist

Then the surplus wood is taken away as soon as possible, before it has time to deprive the useful part of the tree of its useful supply of nutriment, now being distributed through the sap cells, and making new wood, new buds, and new bark The increased supply of food then goes to enlarge the buds, increasing these in size and number, and making the duplicate fruit buds of the single leaf buds. It will be interesting to study the difference between these buds. The leaf bud is a single one, and the fruit buds are made up of several leaf buds massed together, new additions growing at the base of the original one, each of which then bears a flower, and this produces a fruit. This is the result of judicious pruning, and is to be studied and practiced as the most important part of the culture of a fruit tree. And to get the most useful effect in this way the pruning is to be done in the winter.



Stomata. (a) Seen on Leaf of Apple Tree, by aid of Microscope.

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have given a new lease of life to thousands of old wagons. They can be had in any desired height, and any width of tire up to 8 inches. With a set of these wheels you can in a few minutes have either a high or a low down wagon. **The Electric Handy Wagon** is made by skilled workmen, of best selected material—white hickory axles, steel wheels, steel hounds, etc. Guaranteed to carry 4000 lbs. Here is the wagon that will save money for you, as it lasts almost forever. Our catalog describing the uses of these wheels and wagons sent free. Write for it.
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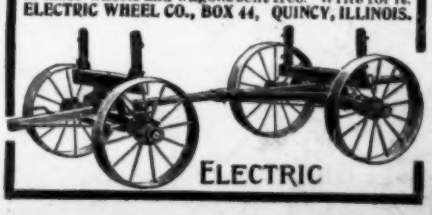

PEACH YELLOWS.

The great authority on peach culture, J. H. Hale, has the following to say of Southern grown peach trees: "A year ago I hinted at the possibility of excessive peach orchard planting the country over. The mad rush continues, and now, were it not for the disease known as 'yellows,' we should soon be face to face with such over production as would make it impossible for the average cultivator to market peaches without loss, much less profit. Yellows, spreading with greater virulence than ever in 1897, made it clear that it was to be even worse in the future, and that all through the central and northern states it is to be a hard fight in future to maintain healthy and profitable orchards. Only those who know the yellows, and dread it, and fight it from start to finish, can hope to succeed. I have in fruiting orchards more peach trees than any man on earth, and I know from sad and dearly bought experience that peach trees grown in any of the northern or central states cannot be depended on as free from yellows, and the only way to secure a healthy tree at the start is to plant southern-grown trees, from below the tainted district. Knowing this as I do I have entirely abandoned growing peach trees at the North."

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Methods in Profitable Fruit Growing.

In establishing an orchard or fruit area the points which seem to be above the rest are, first, the local conditions; second, the purpose for which the fruit is to be grown. The panacea to the query so often made, "What variety or sort shall I plant?" has not yet been found, and never will be found until the local conditions of the querist are known. Ask the questioner what he wants and he will usually answer for himself. There are, however, a number of general principles that may be adopted with safety in planting.

First.—Plant only first-class stock; avoid the buying of trees simply because they may be had cheap, regardless of quality. Many have met with failure in following this rule, and many dollars of worthless stock have been and are being unloaded on the beginner.

Second.—Endeavor to meet, as near as possible, local conditions. Avoid planting in large quantities a variety that has been grown successfullly in another region, different from your own conditions. Such varieties should receive experiment. Consider the adapting of the variety to the local climate as to length of seasons, soils, etc.

Third.—Stick to the planting of such sorts as have been established and their adaptability known. It is a mistake to plant a little of everything and not much of anything. Our attention has been called but recently—in conversation with a fruit grower who has several acres of peaches—to this point. We enquired as to his varieties, and was met with this reply: "I have nearly every known variety grown." On further inquiry we found that he received likewise every known price for his crop, and was discouraged with the results; and it is not to be wondered at.

Fourth.—Choose as to the purpose for which fruit is to be grown, whether for home market, export evaporating, etc. Venture carefully into the field of adoption of new varieties. Experiment, study, read, enquire.

The selection of large trees from the nursery is not always best; the rapid, abnormal growth does not signify that the tree is healthy, but is very liable to be the reverse. A good stocky vigorous, firm tree is easier managed, and in its growth attended with better results. All trees from the nursery should be ordered early in the fall for spring planting. Patronize, whenever possible, home nurseries. In this case the buyer can often visit the nursery and select his own stock, save in freight rates, receive, as a rule, stock in fresher condition, and know more of the reliability of the nurseryman—an important item.

The first years in the life of the tree are the crucial ones. Train and plant the tree to meet the conditions of heat, winds, and soil. Cultivate as a conserver of moisture, growing a cover crop at the right time to assist in carrying plants and trees through the dry periods. The first cover in the spring should be cultivation, the cultivated soil acting as a mulch; later, the cover crop best suited. Nature provides as a protector, a cover in the growth of weeds. We should aim at an improvement as a substitute for weeds—something to act as a natural cover to hold the rains, shade and mulch the soil, and assist, by the growth of weeds, to break up and prepare in the soil the many food materials which go to make growth and fruit. In all farm practices, keeping the ground stirred up or covered with some crop constantly is one of the chief aims. Following this last operation comes the so-called winter orcharding. Before the season closes there are many little things to be attended to that facilitate the hustle of spring work. Rubbish, decayed and diseased fruits should be destroyed. Aside from the disease they may contain, they serve as excellent places for the hibernation of many insects. This, if properly attended to, lessens the spraying expense. Machinery, tools, etc., should be cared for. Time is never wasted in this way, because it is always time saved. Young trees should be banked and protceted from the attacks of rabbits.

In the care of fruit and orchards, the question of spraying is an imperative one. Where spraying is properly followed, and the whys and wherefores thoroughly understood, both as a preventive and as a destroyer, the fruit grower becomes more of a thinker, and avenues in the business never thought of before are opened up. In fact, the training, planting and marketing are modified by this one process. True, there are years, and perhaps a period of years, when spraying may seem of little value; yet there will come a time, after the horse is stolen, that the barn will be locked. Spraying as a preventive or protection, is of importance. "An ounce of prevention is worth a pound of cure." The cost of spraying should induce the grower to produce and market a better article. When it is reported, that it does not pay to spray, usually there is something wrong in the process—either in the mixture used or in the time of its application. In the general observations of spraying, the fruit grower should know what he wants to destroy before he begins. The time for spraying must be understood. The preparation and handling of the solution, doing the work thoroughly and systematically, using only the best constructed machinery. Those pests of the orchards, increasing in number and species, form one of our chief economic problems. We may have good markets for our fruits, and excellent means of transportation, but we must of necesity produce our fruit before we can market it. In the insect world about him, the horticulturist should be ever on the alert prepared to meet these invasions intelligently and deal with them properly. He should have an understanding of some of the general principles pertaining to the habits of insects, bearing in mind that each insect has its own peculiar locality, food-plant and habits of life; and the better he understands this, just that much better will he be able to furnish ways and means for their economic destruction.

The picking, packing and marketing of fruit is the great business part of the whole transaction. It is here where so many failures are met, largely due, to a lack of understanding of the requirements and of the methods pursued in disposing of the fruits in the markets. A study of these conditions shows that no products of the farm should be guarded with greater care than fruit. Hence the necessity of proper handling, grading, packing, shipping and striving to have the fruit arrive in the best possible condition. This branch of the business is in itself a study, and those meeting the financial success will tell you that their work is enhanced by the greater information they may possess regarding methods of marketing. No one should market a poor quality or grade of fruit where he hopes to secure a permanent market. Sort and grade uniformly, using such packages as will best suit the trade. See that all packages are properly labeled with name of grower, grade and to whom shipped. In this way a brand may be known and a reputation secured. Where possible, trained pickers and packers should be employed. Money expended in visiting markets and finding how fruit is handled and sold is never lost. The whole idea of this phase of fruit growing may, we believe, be summed up in comparing it to four corner stones: (1) A thorough business man; (2) a student of the industry; (3) a good market; (4) honest packing and shipping.

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"Did you ever try to say 'Peter Piper picked a peck of pickled peppers?" one of the other boys asked him.

"No," responded the little Boston boy, "consider the impossibility of gathering peppers that are already pickled.

60 CENTS IN SEEDS and a 25 Cent Cash Coupon FOR 10c

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SPECIAL. Each lot of these seeds ordered includes a Cash Coupon, good for 25 cents on purchases of $1 or over from our regular Large Free Catalogue.

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R. H. SHUMWAY, Rockford, Illinois.

..Poultry for Profit..

Contributions invited and inquiries answered.

NOTES.

Snow season is at hand.

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Feed is as important as breed in handling poultry.

* * * * *

Get things in readiness about the poultry yards for the long winter that is coming.

* * * * *

Look after the proper shipping and handling of poultry returning from the shows.

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Separate sick fowls from the flock just as soon as symptoms of illness are noted.

* * * * *

Don't keep laying hens too fat, with but little care, this error may be easily regulated.

* * * * *

To cleanse the poultry house and yard use whitewash, lime, copperas and carbolic acid water freely.

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Aim to have only reliable thermometers to use in operating the incubator, if satisfactory hatches are expected.

* * * * *

Try and get chicks, hatched from eggs laid by hens that were good layers, and not forced or stimulated by high feeding.

* * * * *

Now is an excellent time to weed out the old hens. Give the young healthy hens a chance to follow in the footsteps of their mothers.

* * * * *

The poultry yard is doing more to keep down the bill at the "corner grocery" than any other department on the farm.

* * * * *

Special judges for the different breeds of poultry instead of one or two judges for all the breeds on exhibition, would be a most satisfactory innovation at our winter shows.

* * * * *

Too many changes in breeds by the fancier before a thorough trial of the breed has been given is often noted. The individual who sticks to a breed until all the good and bad qualities are noted, is the one who meets success nine times out of ten.

* * * * *

Fall is the best time to purchase stock intended for breeding. Get the birds accustomed to their new home and surroundings. With the proper housing they will lay a good many eggs during the winter months, a large number of which may be used in early hatching.

* * * * *

On no account should birds be dipped in hot water before being plucked. Pluck poultry dry if you are looking for the top price in the market. No birds should be packed for market until after they are thoroughly cooled. Poultry of all kinds will bring a good price this fall and coming winter, and those exercising care in fattening, killing and marketing are sure to win out in profits.

* * * * *

Silage for poultry is one of the best green feeds for winter. Where one has no silo, some clover or corn may be preserved in a barrel for the hens. Here is the way one successful poultryman does it: Select airtight barrels and in the bottom place 6 inches of green grass or clover. Pound this down with a rammer and continue filling and pounding until the barrel is full. Cut corn fodder can be used in the same way. The tighter the material is packed the better it will keep. Press the head in and keep the barrel in a cool place.

* * * * *

COMFORTABLE QUARTERS.

Too much can not be said about the need of making things comfortable for the laying hen during winter. She should be fed right, have plenty of sunshine and light as well in the winter as summer, giving the hens a chance to take "sun baths." The "dust bath" should be accessible at all times in order to keep hens free from lice. The scratching pen should be in a sunny part of the poultry house and frequently renewed with fresh straw, chaff or litter. Clean out the nest boxes and keep them supplied with fresh straw. Clean the hen house out twice a week. Make the surroundings as comfortable as possible and appreciation will be shown by an increase of eggs through the winter, thereby adding profits to the returns from the poultry pens.

* * * * *

FEEDING YOUNG CHICKS.

We often hear an expression from those using incubators that "We have no trouble in hatching the eggs, but" the difficulty is in raising the chicks. One of the chief causes for failure in this respect is due to the use of improper feed in the early life of the chicks.

Young chicks do not require feeding for the first twenty-four hours after hatching, but when feeding begins care should be exercised in the kind of food used By experience we have found that stale bread and milk to be one of the best chick feeds we have used to begin with. The bread should be crumbled fine, and placed where the chicks can have free access to it, and where they can step on it. Later on cracked corn may be used. To help along the feed give the chicks variety, plenty of fresh air and sunlight.

* * * * *

Poultry for the Christmas Trade.

Poultry of all kinds will be high priced this winter. Turkeys are exceptionally scarce throughout the country and are already selling at fancy prices. There will certainly be a demand for good poultry throughout the winter, and especially so during the holidays. Surplus chickens, or those selected for market, should be fattened at the earliest possible date. Too many neglect to start the fattening early enough and in consequence are obliged to market later, when the market is likely to be glutted and the prices lower than at Christmas time. The following method for fattening poultry is a very good one to employ, in the fattening pen. After penning up the birds get some oats ground as fine as possible, sift to separate the hulls; to the oat meal add skim milk, making a gruel. Feed this gruel to the birds in liberal quantities. Such a ration improves the quality of the meat to a high degree, besides it is a ration that encourages rapid fattening. One of the best feeds to use in fattening turkeys is to make a mixture of corn, oats and wheat. The more thoroughly the corn is seasoned, the better. The mixture should not be put on the ground, as the turkeys would be sure to pick out the corn and most of the wheat, leaving the oats. Feed in pans, boxes or troughs. Turkeys must not be shut up while being fattened. If they are liberally fed they will not wander about to any considerable extent.

* * * * *

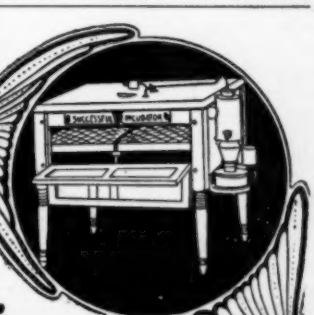
Selection in the Poultry Yard.

A practical poultry raiser and one who has been successful from a financial standpoint, in the rearing of poultry says:

First and most important in the rearing of poultry is the application of the principle of selection—the great first principle in the breeding of all kinds of live stock. Natural selection operates very slowly; to accomplish marked results, it requires long periods of time. Artificial selection, when intelligently directed, advances along the lines marked out for it with a rapidity which often appears little short of miraculous.

Many seem to appreciate the necessity of careful selection to develop a breed and bring it to a certain standard, but not to realize so well that just as careful selection is required to keep a flock of thoroughbred poultry up to the average of improved stock of their kind, or how the natural tendencies begin to assert themselves the moment the breeder

BRINGS BIG HATCHES



That's the word that comes from poultry raisers all over the country. Big hatches mean big profits, and the way to get big hatches is to follow the lead of the best chicken man in the world and run a

Successful Incubator and Brooder.

SUCCEED WITH A SUCCESSFUL

Not a delicate toy, but an every day, money-making machine, that is always ready for business and knows no failures. Built to hatch chickens, it does its work perfectly. An incubator that does not swell nor shrink from constant use. We can explain and you will understand when you read our Incubator Book. You are going to have one, are you not? The English edition of 156 illustrated pages will be sent anywhere free. The other four of them in four different languages are also sent free.

DES MOINES INCUBATOR CO.,
Dept. 415, Des Moines, Ia. Dept. 415, Buffalo, N. Y.

relaxes his effort in the least. Many of the features most prized by those who value fancy points first, and some of those most valued by those who keep fowls for economical purposes, could never have been developed under natural conditions. From the posibility of maintaining these extreme forms, the poultry breeder who keeps to more rational lines may be convinced of the certainty that he may get and keep any reasonable degree of development of a feature or quality which he desires in his stock. An example of the value of the principle of selection is shown in the making of the breeds of the American class. The Barred Plymouth Rock, the oldest of them, has been before the public only about thirty years. Varieties so widely popular as the White Wyandotte and the White Plymouth Rock were very new ten or twelve years ago.

There are a great many farm poultry keepers who, while recognizing the uses of selection, do not see how necessary it is that they should take specific measures to insure that a right selection is actually accomplished. The poultry keeper who does not carefully reserve his best birds rarely breeds from the best of any year's produce. His earliest and best pullets and cockerels go to market ,because they bring the best prices when sold for table consumption; the hens to lay earliest are the first to go broody, and are set on the eggs from the inferior members of the flock, and it may often happen that an inferior male is a much surer breeder than one vastly his superior at all other points. Wherever you find a really good flock of fowls, you will find that the person in charge has some system of selection which will account for this excellence. The logic of the situation requires that a poultry keeper should make sure that only the eggs of his best hens, fertilized by his best males, are used in incubation. Selection is not complete if it stops short of the separation of the fowls selected.

* * * * *

Cream from a Poultry Scrap Book.

October should find the poultry house thoroughly cleaned, with a new coat of whitewash on the walls. If a dirt floor the same should have been renewed while yet ground outdoors could be had reasonably dry. If a loam floor, that, too, might in many instance be replaced with new to great advantage.

"The same is true of such fixtures as roosts and nest boxes, for after years of continuous use these become so foul and pest ridden that it is easier and cheaper to tear them all out and replace them with new than to clean them."

"The roof perhaps first of all needs attention, for a tight roof is a score of times more necessary than a tight house. When building a poultry house, second hand or low grade lumber will do nicely, and amateur work, for all practical purposes be equal to what a carpenter could do—all but the roof. Let the roof be no makesnift."

"With a leaky roof you cannot have a dry house in midwinter, and damp quarters are fatal to success. They mean colds, roup, etc."

"On the other hand, a tight house always means a damp one during the above season, unless there be a fire, and a fire is worse even than a damp house."

"There is only one way to have a dry house, and that is, first, a good, waterproof roof, and second, constant ventilation with throwing open wide all doors and windows every pleasant day during the middle of same."

"October should find all matured pullets as well as the old hens in the quarters they are to occupy for the winter. There should be new scratching material under the shed and the grain rations fed in these daily."

"During our cold autumn rains I should advise shutting in the above class of stock to the house and sheds. Especially if house and shed are as large and roomy as they should be and not overcrowded. This method will avoid many an occosional 'cold' among your flock.

"With a little forethought and management stock can be kept busy and contented indoors during such weather, and be the better in every way. Cold rains certainly are not conducive to laying or even to health, I don't care how vigorous the stock."

"After some months of regular penning on rainy days it will be found that they have learned that it is more comfortable indoors than out and they will stay indoors without penning."

"Don't close up tight, a roof simply with perhaps a curtain on the side this rain is blowing from, will suffice."

"The ideal breed does not exist. The ideal breed for winter laying even has not yet been produced. Why read whole columns describing them. We don't have them and never will have them, any more than we have anything else perfect in this world."

"Eggs, winter eggs, summer eggs, eggs anything, are the most profitable branch of the poultry business."

"Get rid of the idea that you could make a success with broilers, winter broilers especially. There are more failures with broilers than with all other branches of the business combined. Perhaps one man in a thousand is successful."

"You can find men in every state, perhaps in every county and every town who have tried broilers and failed. You can look long and closely until you find one man that is successful."

"And yet the string of the fiddle that is most played on by the men writing columns on the ideal breed is, that the chicks make the best broilers."

"Now, the truth is for home consumption and home market consumption the chicks of most breeds make good broilers. I defy any of these ideal for broilers fellows to prove that a well grown Leghorn of Minorca chick at eight or ten weeks old is one whit poorer eating than a Dotte or a Brahma chick. Such claims of superiority are all nonsense and without foundation in fact."

"And as for being the superior for raising in large numbers for large markets, what's the good if you can't do thhe above successfully?"

"Finally, eggs are the safest and surest road in practical every day money making poultry keeping."—W. T. Wittman in American Poultry Advocate.

* * * * *

HENS FOR WINTER LAYING.

Those who hope to have a full supply of fresh laid eggs during the winter months must do their part or be disappointed. From among all your hens select the best that are not over one year old. Hens past two years old seldom pay for their keep in producing eggs for market. Having selected all the hens that you intend keeping for the winter, house them by themselves, if possible, for the hens will do better alone, as will the pullets. When kept together the hens are quite apt to quarrel with the pullets, or boss it over them, and the young and more active pullets are naturally quicker to move and will get the greater part of the food.

* * * * *

TO PREVENT COCK-CROWING.

It is quite easy to keep fowls and prevent them from crowing. All that is needed, says "Country Life." is a slight string over the neck and fastened to a foot. It is the habit of chanticleer to throw back his head when crowing, and he will not crow if he is prevented, as he may be by the string, from doing so. The contrivance has the great merit of inflicting no pain whatever. The bird scarcely knows of the pressure of the string till he tries to crow, and a harmless jerk brings him to order.

110 Yards Fine Poultry.

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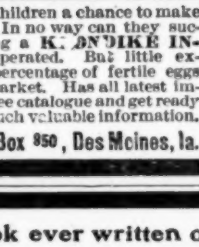

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You should read this book before buying. It is a lifetime's experience of the man who knows incubators best. You will know then what you need. You will know why some succeed and some fail. You will know how to make the poultry business pay. This book also has a catalog of Racine Incubators and Brooders. It is free; write for it.
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The Home Circle.

Devoted to the home folks. Contributions invited

THANKSGIVING.

"Ah! on Thanksgiving day, when from
East and from West,
From North and from South come the
pilgrim and guest;
When the gray-haired New Englander
sees 'round his board
The old broken links of affection re-
stored;
When the care wearied man seeks his
mother once more,
And the worn matron smiles where
the girl smiled before.—
What moistens the lip and what
brightens the eye?
What calls back the past like the rich
pumpkin pie?"

THANKSGIVING, the great American feast day, is one of the most destinctive holidays celebrated in our home. Thanksgiving day existed early times and the exact origin is not known. The Hebrew tabernacles, the Greek feast of Demeter, the Roman Crealia, and the Saxon Harvest Home have been annually celebrated for centuries.

The American festival was first celebrated at Plymouth, Mass., 1621, by the Pilgrims whose trials and experiences are fireside stories, familiar to us all. From this hopeful, struggling band of faithful men and women has sprung much of the blood that goes to make up our highest types of American womanhood and manhood.

The first American Thanksgiving was a most humble one, yet one of the most famous in the annals of history. It was a day of praise in a true sense. We also find that the feast was bountifully supplied with fowl and the turkey found a place on the menu on that occasion. According to the record of Edwin Winslow, "our governor sent four men fowling so that we might, after a special manner, rejoice together. They four in one day killed as much fowl as, with a little help besides, served the company nearly a week. A which time, among other recreations, we exercised our arms, many of the Indians coming among us, among the rest their greatest king, Massasoit, with some ninety men, whom for three days we entertained and feasted."

The hospitality of the Pilgrim fathers has been carried down to the present time. Thanksgiving Day in 1902 will long be remembered in the homes of the American people. The past year has been one of prosperity, and the horn of plenty is well filled. Throughout the length and breadth of our land may be heard the hum of machinery giving employment to millions. The farmers as a whole have been blessed with abundance of crops as never before and all lines of agriculture show a healthy growth and development. Let us then be truly thankful for the good things that have been our pleasure to enjoy.

* * * * *

'Christmas comes but once a year,"
'Twas wisdom that so planned it;
If it came oftener, we fear
No pocketbook could stand it.

* * * * *

He who judges mercifully, with himself so be judged.

* * * * *

Charity is the salt of riches.

MY MOTHER.

Where dwells the being in whose bosom affection's tender call meets with a responsive throb of feeling that does not cherish with pleasure the remembrance of a mother's love and the assiduous attention of a mother's devotedness? When the first half-meant glistening of the infant eye bespoke "the first dawn of reason;" when the puny arms first clasped the maternal neck, and sweet baby seemed "a pearl of price" on the bosom; who with soul-enchanting fervor pressed the dear treasure to its faithful home? And when the chuckling laugh, the little, restless, elastic limbs of her dearest, in its playful humor, won her smile, who caressed the sportive child and gave back kiss for kiss? It was the Mother.

When the tottering limbs essayed to move in the harmony of nature, the goal of the infant trial was the parent knee, the reward, the parent embrace. The first faint lisp of language, that seems to be taught by an angel, comes on the Mother's ear like undefined music; and the first trial is to sound the mother's name. O thought-enkindling word, connected with every remembered pang of sorrow and every association of former happiness!

The hey-day of youth has passed, and with it have been separated the closer ties that bound us to our Mothers. Yet the chain of affection has been but loosened; not a link of it has been broken. When the wild wars of passion rages, the memory of a Mother's love comes like magic over our souls, and like "oil on troubled waters" calms it to rest

O my Mother! may he who has felt love like thine never know love from any if he forgets thee, and may the rich blessings of heaven descend on thee, as thou hast often praved for them upon thy child!

* * * * *

AN INTERESTING GAME.

As it is the time of the year when our young people gather together to spend an evening, it is nice to have some new entertainment to suggest. One which will afford quite a little wholesome amusement is as follows: Distribute among the company lead pencils and sheets of paper, the latter numbered in a column down the left side. Have some one sit down to the organ or piano and play a few strains of some familiar air. Then give three minutes to the guests to write after the number one the name of the air played. In order to make the game a success no one should tell his neighbor the name of the tune, or repeat it aloud.

At the end of the intermission let a strain of another familiar tune be played, and three minutes again allowed for the guessing. In this manner as many tunes may be played as desired. Then each guest should sign his name, or initials to his paper. They are then collected and a committee appointed to look them over, judging which is the best and which is the poorest.

If desired small favors may be awarded to the highest and the poorest in the guessing. The prize for the poorest, known as the "booby prize," is usually something laughable.

E. R. F.

* * * * *

A man may be known by three things: by his conduct in money matters, by his behavior at the table, and by his demeanor when angry.

THE NEW BABY.

Yes, I've got a little brother,
Never asked to have him, nuther;
But he's here.
They just went away and bought him,
And, last week, the doctor brought him,
Weren't that queer?
When I heard the news from Molly,
Why, I thought at first 'twas jolly,
'Cause, you see,
I s'posed I could go and get him,
And then mamma, course, would let him
Play with me.
But when I had once looked at him,
"Why," I says, "great snakes is that him!
Just that mite!"
They said "Yes," and "Ain't he cunnin'?"
And I thought they must be funnin'—
He's a sight!
He's so small, it's just amazin',
And you'd think he was blazin'—
He's so red.
And his nose is like a berry,
And he's bald as Uncle Jerry
On his head.
Say, he isn't worth a brick,
All he does is cry and kick;
He can't stop.
Won't sit up—you can't arrange him—
I don't see why pa don't change him
At the shop.
Now we've got to dress and feed him,
And we really didn't need him
More'n a frog!
Why'd they buy a baby brother
When they know I'd good deal ruther
Had a dog?

—Kansas Farmer.

* * * * *

THE BABY.

Speaking of the baby, some one wants to know why we do not let it eat meat. Meat is excellent food for young chickens, why not for young humans? In the first place, a child does not and cannot chew meat properly. The first teeth are not strong enough for such chewing. The meat is swallowed half chewed, and the little stomach is overworked. Again, meat makes the child fretful and bad-tempered. It is too stimulating. It makes the glands soft and spongy. We have made quite a study of this matter for the past eight years, and have had several children in the family that were troubled with throat diseases. We are well satisfied that the trouble with 90 per cent of the cross and fretful children with enlarged throats and almost constant colds or catarrh, lies in their diet. Meat is responsible for many ills of childhood. Our children shall not eat lean meat until their second teeth are well formed. Oatmeal, or other whole crushed grain, well cooked, with good milk and cream, fruit and vegetables—not too much potatoe—a little fish and good bread and butter, will make childflesh that one may be proud of It will not do to compare a chicken with a child, for the chicken can use stones to grind up its food.—Rural New Yorker.

* * * * *

The question of the employment of women in the government service is receiving a large share of attention on the part of officers in the United States service. It has been noticed by them that the proportion of women in the public employ is gradually increasing. There are usually more women than men who are able to pass the civil service examinations, but the ratio of appointments is about the same. It has been stated that the reason why the aggregate number of women is increasing in the department service is that they do not leave their places to go into private occupations as men do.

* * * * *

Mould in cellar is easily disposed of by the liberal use of a scrubbing brush, followed by a thorough application of white wash.

* * * * *

It is better to give than to lend. To give employment is better than either.

THE FOOT PATH OF PEACE.

To be glad of life, because it gives you the chance to love and work and to play and to look up at the stars; to be satisfied with your possessions, but not contented with yourself until you have made the best of them; to despise nothing in the world except falsehood and meanness, and to fear nothing except cowardice; to be governed by your admirations rather than by your disgusts; to covet nothing that is your neighbor's except his kindness of heart and gentleness of manners; to think seldom of your enemies, often of your friends, and every day of Christ, and to spend as much time as you can, with body and with spirit, in God's out of doors, these are little guide-posts on the foot-path to peace. Henry Van Dyke.

* * * * *

COUNTRY GIRL'S OPPORTUNITIES

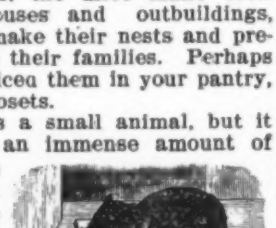
"Many a woman who is busy in securing the comfort of the home circle, feels as though her work amounted to very little, because it is not properly appreciated. For this reason, many country girls crowd into the city, to swell the vast army of wage-earners, even while they know that there is plenty of work in the homes surrounding theirs, and that their places must be filled with inferior or foreign laborers. A few fortunate ones may secure positions as typewriters, bookkeepers, etc., but the majority are obliged to do what they can. If country girls would put their pride out of the way, and do what they could find to do in the country, they might be able to make fair wages, and still remain in pleasant, healthful places. It is almost impossible to get good help, either in the house, or to care for the sick, etc., in the country, without sending to the city for it, and many busy housewives are obliged to struggle along, utterly unable to do their daily work, who would be glad to hire sone one of the young girls for a few days at a time now and then. Sick peope who are unable to hire a high-priced trained nurse often suffer for care when the members of the family are busy or tired out. Yet our country girls rush to the city shops and stores, and work until health fails, to earn simply enough to pay board in crowded houses and buy necessary clothes."

* * * * *

ABOUT MICE.

Mice as well as people are seeking winter quarters. As the weather gets cold outdoors, the mice make their way into houses and outbuildings, where they make their nests and prepare to raise their families. Perhaps you have noticed them in your pantry, cellar and closets.

A mouse is a small animal, but it can destroy an immense amount of property; it is not so much what they eat as it is the dirt and litter they make and the holes they gnaw in woodwork and clothing.



If you hope to rid your house of these little scavangers, it is well to keep in mind the old adage, "A stitch in time saves nine." There are many devices for trapping mice, one of the latest being the "out of sight" trap. These are good for setting by a mouse hole or along a path mice are known to travel, but they must be watched daily and it is not well to put them outside the door while a victim dies, for the neighbor's dog may think it is for his special benefit, to save him time and labor and after eating his meal out in the grass, forget to bring the mouse trap back.

One of the easiest methods for killing mice is to get a box of "Rough on Rats," spread it on pieces of bread and butter or cheese and place it where the mice have been bothering. If you have a pet cat, shut her up or put the poison where she cannot get at it. Some dislike to use poison for fear of having dead mice about the house, but after eating this poison mice do not die until they get a drink, so if one is careful not to have water or milk where the mice can get it, they will have to go away from the house to get a drink and will die there.

* * * * *

FRUIT CANNING.

Fresh fruits are used on the breakfast table of almost every home where they can be afforded, and many people who have tried eating fruit daily say it saves medicine and doctor's bills. But during the winter season fresh fruits are expensive, an cannot be afforded by all, or used as freely as desired by others. The next best thing then, is to substitute canned fruits.

There is an old idea that all fruit canned should be preserved, that is, heavily sweetened, but this is extravagant, and the surplus of the sugar required for preserving more than counteracts the good effects of the fruit. If canned fruit is to take the place of fresh fruit, why not prepare it so that it will be as nearly like the fresh fruit as possible?

There are too many who do not know how to care for fruit. The task of preparing fruit for the jar is a tedious one, and the weather is always hot during canning time; fortunate the woman who does not need to burden herself with all the details, but every housewife should thoroughly understand the care and preservation of fruits.

If depending upon the market for fruit to can, the best time to buy is when the fruit is at the height of its season, as then the price is lowest, and one has a better opportunity for selection. One should know how many quarts a bushel of each fruit will make, and buy accordingly.

All fruits should be carefully prepared, the important point being to remove all specks and bruised portions, as they tend to start fermentation. Some fruits cook to pieces easily, and with these it is best to make a sirup of sugar and water first, then add the fruit. But this method requires more sugar, as some is wasted in the skimming, so for ordinary purposes it is best to boil and skim the fruit first, then add the sugar. Let sugar be added with the idea of flavoring. Mild fruits lose their flavor if heavily sweetened, and if it were not for shape and color one could scarce-

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24 Liberty St., WINONA, MINN., U. S. A.

ly be distinguished from another. It is well to have some preserves and jellies, but they are to be used on special occasions or in small quantities, while canned fruits are to be used commonly and freely.

All fruits should be thoroughly heated before canning, to expel the air and destroy germ life, but it is not best to allow them to cook a long time unless a hard fruit is to be softened, or fruit butters or preserves are desired.

A good way to prepare raspberries, blackberries, or strawberries is to fill jars with the sorted fruit, place them in a steamer, and heat thoroughly; remove the jars, and from one jar fill others as full as possible without jamming the fruit, then cover with hot, sweetened water and seal.

After canning very juicy fruits there often remains considerable rich juice; if this is strained and sealed separately it makes an appetizing and wholesome drink for the winter. Unfermented juice from the grape is especially desirable in cases of sickness. A fruit punch may be made by adding to this juice sugar, lemons, and other fresh fruits, and diluting with water.

Some are of the opinion that the fruit will not keep unless heavily sweetened, and it is true, that if not air-tight, preserves are more likely to keep than simply canned fruit; but if fruit is well prepared, thoroughly heated, and the jars completely filled, so as to leave no air space, then carefully sealed and stored in a cool, dark, well ventilated place it will keep indefinitely.

The name "Mason Jar" used to be a warrant for a perfect jar, but the royalty has been sold, and some companies make perfect ones, while others do not. Those made of green-tinted glass are the best, and it is well to notice if the seams of the jar are smooth where the rubber is to fit over, so as not to interfere with the tight fitting of the cover.

Never try using a rubber the second time; it might be all right, but rubbers are cheap, and the comparative worth of the fruit will not warrant the risk. Always put rubbers to soak in warm water before using. When filled, each can should be labeled, giving the kind of fruit and date of canning.

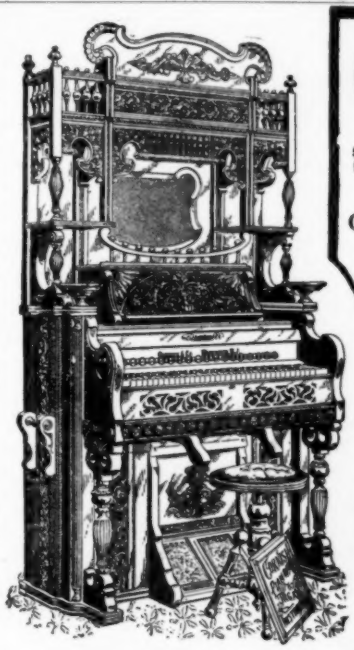
A good fruit closet is something every house should afford. The essential points are that it should be dark and well ventilated. The shelves should be deep enough to hold two rows of glass jars easily, and high enough to allow at least three inches above a two-quart jar. It is well to have a deep shelf at the bottom for stone jars. The shelves should be arranged so they may be easily scrubbed or covered with papers which may be changed.

When empty jars begin to accumulate in the early winter it is an economical plan to refill them with apple sauce. Apples are then plentiful and cheap, and the sauce is convenient for use during late winter and early spring, when fresh apples are scarce.

Canning of fruits is commonly considered a difficult task, but if a few fundamental principles are understood and carefully observed, it is really a simple matter.—Contributed to Successful Farming.

* * * * *

Director Jas. W. Wilson of the South Dakota Experiment Station: "Successful Farming has the appearance of a very useful sheet and contains a great deal of practical information which is of benefit to the farmers."



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The following receipts are first-class ones, fit for the tables of our most critical epicurians. We have tried them and know whereof we speak.

Cream of Celery Soup.

One head of celery, 1 quart of milk or ½ milk and ½ water, 1 tablespoonful butter, 1 tablespoonful flour, ½ teaspoonful salt, ¼ teaspoonful white pepper, 1 teaspoonful chopped onion.

The celery should be washed, then cut into dice and cooked in boiling salt water, until tender. Mash through a strainer. Heat the milk in a double boiler; make a white sauce by melting the butter, adding the flour, salt and pepper, then a cup of the hot milk, a little at a time and cook for ten minutes. Add this to the milk in the double boiler. Then add the strained celery and celery stock. Cook for five minutes, and serve with crisp crackers.

Cabbage Salad.

Four cups cabbage, chopped fine, 1 cup cream, beaten or whipped, 1 heaping teaspoon powdered sugar, 2 teaspoonfuls salt, ½ teaspoonful pepper, juice of one lemon.

Maranate the cabbage with lemon juice, then blend in cream, pepper and salt and serve on a bed of lettuce.

Stuffed Eggs.

Remove the shell from hard cooked eggs, and cut them in two cross-wise. Remove the yolks and wash through a strainer. For the yolks of 6 eggs add 2 tablespoonfuls finely ground ham or tongue, 1 tablespoonful butter, ½ tablespoonful salt, sprinkle with white pepper. Mix to a smooth paste, and fill the whites. Serve cold.

Beef Porcupine.

Take 3 cups of chopped meat; 1 cup of bread crumbs or mashed potatoes, 1 teaspoonful chopped bacon, 1 teaspoonful salt, 1 teaspoonful green pepper, chopped fine, 1 teaspoonful lemon juice, 2 eggs beaten slighly, moisten with gravy or soup stock to form into loaf. Insert narrow strips of bacon all over the top. Bake until brown. This dish may be served either hot or cold.

Friar's Omlet.

Steam ½ dozen apples (pared and cored) and mash; add ½ cup of sugar, the juice and rind of ½ lemon, yolks of 3 well beaten eggs; add at the last the stiffly beaten whites of the eggs. Butter 1 cup of bread crumbs with 1 tablespoonful of melted butter; sprinkle one-third of the crumbs in the bottom of a pan, and the rest on top of the apples.

Serve either hot or cold, with cream or boiled custard.

* * * * *

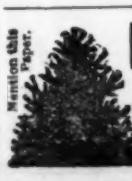
Prof. J. H. Sheppard, M. S. A. of the North Dakota Agricultural College: "I have perused with interest the initial copy of "Successful Farming." It is a fact that most of the grain and stock producers of the country fail to read the vast amount of material which will prove valuable to them, if they have the information. * * * A publication of the sort which your journal represents will enable people who can not afford a number of other publications, and who have not the time to read and digest them even if they are able to buy them, an opportunity to secure the gist of the information that they contain at a nominal cost, both in time and money. * * * I wish you success."

* * * * *

It is the bounty of nature that we live; but of philosophy, that we live well."

* * * * *

"All the world is on the hunt for a good square meal three times a day."



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LIVING WATERS.

There are some hearts like wells, green-mossed and deep
As ever Summer saw;
And cool their water is,—yea, cool and sweet;
But you must come to draw.
They hoard not, yet they rest in calm content,
And not unsought will give;
They can be quiet with their wealth unspent,
So self-contained they live.

And there are some like springs, that bubbling burst
To follow dusty ways,
And run with offered cup to quench his thirst
Where the tired traveller strays;
That never ask the meadows if they want
What is their joy to give;—
Unasked, their lives to other life they grant,
So self-bestowed they live.

And One is like the ocean, deep and wide,
Wherein all waters fall;
That girdles the broad earth, and draws the tide,
Feeding and bearing all;
That broods the mists, that sends the clouds abroad,
That takes again to give;—
Even the great and loving heart of God,
Whereby all love doth live.

—Caroline Spencer.

* * * * *

TALE OF A STAMP.

I'm a stamp—
A postage stamp—
A two-center;
Don't want to brag,
But I was never
Licked;
Except once;
By a gentleman, too;
He put me on
To a good thing;
It was an envelope—
Perfumed, pink, square;
I've been stuck on
That envelope
Ever since;
He dropped us—
The envelope and me—
Through a slot in a dark box;
But we were rescued
By a mail clerk;
More's the pity;
He hit me an awful
Smash with a hammer;
It left my face
Black and blue;
Then I went on a long
Journey
Of two days;
And when we arrived—
The pink envelope and me—
We were presented
To a perfect love
Of a girl,
With a stunningest pair
Of blue eyes
That ever blinked;
Say, she's a dream!
Well, she mutilated
The pink envelope
And tore one corner
Of me off
With a hairpin;
Then she read what
Was inside
The pink envelope.
I never saw a girl blush
So beautifully!
I would be stuck
On her—if I could.
Well, she placed
The writing back
In the pink envelope;
Then she kissed me.
O, you little godlets!
Her lips were ripe
As cherries.
And warm
As the summer sun.
We—
The pink envelope and me—
Are now
Nesting snugly
In her bosom;
We can hear
Her heart throb;
When it goes fastest
She takes us out
And kisses me.
O, say
This is great!
I'm glad
I'm a stamp—
A two-center.

BILL OF FARE FOR AN APPLE YEAR.

By Iowa Campbell.

Breakfast.

Fried Apples, Apple Butter.
Raw Apples.

Apple Dumplings.
Spiced Apples. Apple Jelly.
Apple Pudding. Apple Pie.

Tea.

Apple Sauce.
Baked Apples. Apple Snow.

In order to avoid monotony these may be changed from day to day. For example: One might have baked apples for dinner and cold apple pudding for tea. The apple snow might be served with apple pie. The apple butter and the apple jelly may exchange places, in case the cook has not been sufficiently thoughtful to make both apple cider butter and spiced apple butter.

Fried apples are cooked skinned or unskinned; the essentials are sliced apples in a well buttered pan, sweetened, covered, and sufficintly heated. They are served hot, and are delicious as a change from apple sauce.

Apple pie may be improved by being served with cheese.

Sweet apples make the best spiced apples. They should be cooked in water until soft enough to be easily pierced with a fork, then dipped out and boiled about one minute in the syrup made of one cup of vinegar and two cups of sugar with spice to suit the taste. Whole cloves, allspice and a little ginger-root gives a pleasant flavor. Cinnamon sometimes makes the apples black. These apples may be put in an open jar and will keep for months if the apples are covered with the syrup.

Apple snow is sweetened and mashed apple sauce added to the stiffly beaten whites of eggs; one cup of apple to two whites, or more, as you wish.

Sugar sprinkled on tart apples before cooking helps to preserve their shape.

For apple jelly use the peelings and cores, providing the cores are not inhabited.

Tapioca apple pudding tastes good if one likes it and is hungry. At other times a pudding may be made by placing the peeled and quartered apples with sugar and butter in a pudding dish and covering with a soft dough similar to biscuit dough, but not too stiff to stir with a spoon. Bake, and serve with cream.

* * * * *

The navy department has issued a new cook book which is to be law for cooks on every war vessel of the United States. The book includes recipes for standard articles of food, soups, meats, fish, bread, canned food and desserts of all kinds. It is explained that these recipes are deduced from a series of experiments made with articles of the navy ration.

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How Polly Saved the Express.

KANE CREEK was a railroad crossing on the S. and C. C. Railroad, about two miles from the division terminal at Mercer. It was in the midst of a scrubby pine forest with a sandy road crooking out from the trees on one side and into the trees on the other. There were only two or three houses, a little general store with a porch like the visor of a military cap, and a school house, all arranged in a scraggly row along the railroad track.

A dozen trains whirled through Kane Creek every day with only a shriek of greeting and a whipping wake of fine sand. Only two of them paid the slightest attention to the girl in a blue gingham dress who stood in the little observation window. One of them was the way freight which stopped at Kane's every time it came along while the conductor handed the girl a bundle of yellow papers and received another like it in return. The other was the night express, westward bound from St. Paul, and running at forty miles an hour. It was a splendid train—ten cars, with the finest engine on the road, big Number Six Hundred Six. As its glaring eye flashed around the bend in the direction of Mercer, the girl in the gingham dress often thought of the great train as a powerful and ferocious beast snorting and roaring westward on a race with the sun. It was a beast, but it was well trained, and she knew the hand that trained it. When the train was a mile away there were always two blasts on the whistle. Every one else in Kane's thought it meant simply, "wake up, look out!"—for that is what all locomotives say at every crossing—but the girl in the gingham dress heard "Hello Polly," and darting out on the platform and waves her handkerchief. As the great train thundered nearer a hand was thrust from the engineer's window, and, although it was usually dark, she could see the flutter of something white, and oftentimes as the engine darted past the station she heard the burred sound of a voice and caught the glimpse of a grimy face and a blue jean jacket. And then she went back to her place in the little station house with a sigh of deep contentment.

For it was a moment of great joy to Polly Marshall when her father's engine went through. Polly was the station agent at Kane Creek—and one could have told that a woman presided in the little depot, for was there not always a bouquet in the window and dainty pictures surrounding the grimy time tables on the walls, and a kitten curling upon the doorstep? At seventeen Polly had gone in as assistant to learn telegraphy and when Clark, the agent, was called to Mercer the company had left the independent girl in charge. She and her father lived in one of the wooden houses a stone's throw back from the depot, and since Polly's mother died they had been everything to each other.

Engineer Marshall was a big, silent man, and his companions, some of them thought him gruff and ill tempered, but to Polly he was always tender as a kitten. Often when she was a little girl he took her down to Mercer on his engine, and while she sat on his black leather seat at the cab window, clinging on with both hands, he explained to her how the big black creature under them was started and stopped, what this brass crank was for, and how, when the engine squeaked here or squealed there, a little oil was needed in this cup or in that creice. Polly had learned to know an engine as well as she knew the fleat little pantry in the house at home. Indeed, she had more than once managed the levers and the throttle, although it was very heavy work for a girl to do.

It was one night late in the fall that Polly Marshall had need of all her knowledge of engines. She was sitting at her desk in the little observation window, a shaded light throwing its rays down on her telegraph instruments and the sounder clicking sleepily. Suddenly she was startled by the suden call of her number. Instantly her fingers sought the keys, and she gave an answer that signified that she was all attention. "Look out for ——" clicked the sounder, and then it suddenly ceased, and try as she would Polly could get no further communication with the station next to the eastward. What could the trouble be? What was she to look out for? Polly sprang to her feet, remembering that the night express, of which her father was the engineer, was the next train due. Could anything be the matter? She ran out on the dark platform to see that her lights were all in place and that the switches were properly set, so that the express would slip past the station without an accident. Then she went back and called up Mercer.

"Can you get Pickney?" she asked.

Pickney was the station which had sent her the warning dispatch so mysteriously interrupted. She knew the operator at Pickney well—every night he told her of the approach of her father's train, and whether or not it left is station on time.

"Pickney quiet; can't get answer," was the report of the wires. "What's the trouble?"

Polly answered as well as she could.

Her father's train was now due. It should be whistling cheerily at the lower bend. Polly stepped out on the platform and peered up the track. Yes, there was the familiar headlight—she would have known it among a hundred. Then came the whistle. "Hello Polly," and Polly ran back into her office much relieved and sat down to warn Mercer. At that instant she heard a peculiar grating sound that sent her heart quivering deep in her bosom. Then there was the shrill scream of the locomotive whistle, suddenly interrupted, as if the hand that had drawn the lever had been struck from its place. Polly knew it was a cry of distress. It seemed to say "Help, in a long tremulous wail. Instantly Polly darted outside and flew up the track. Already the express should have thundered past the station, but she could see its headlight a hundred yards or more away. The train had stopped.

With a hundred terrifying questions flashing through her mind, Polly ran on through the gloom. When she was almost in range of the big headlight she saw a half dozen armed men swarming around the engine, she heard fierce oaths, and then the engine started up again. She saw in an instant that it had been cut free from the train. In the cab window, where her father usually stood, there was a big, unfamiliar figure managing the lever and throttle. As the locomotive passed her on its way up the track she saw that the man in the cab wore a black mask on his face, and then she knew what had happened. She understood why Pickney had tried to warn her and failed. Robbers had held up the train and were preparing to rob the express car.

For a moment Polly was torn with doubt and terror. Had they shot her father? She knew that he never would submit to have his train captured witnout a struggle. Should she go to him? Then she remembered her station and the telegraph, and without a moment's delay she was flying down the track toward the depot. She would send for help to Mercer. But squarely in front of the little depot the lo-

A DARKY'S PRAYER.

A white minister was conducting religious services in a colored church in North Carolina recently. After exhorting a bit, he asked an old colored deacon to lead in prayer, and, according to the Roanoke News, this is the appeal which the brother in black offered for his brother in white: "O Lord, gib him de eye of de eagle dat he spy out sin afar off. Glue his hands to de gospel plow. Tie his tongue to le line ob truth. Nail his ear to de gospel pole. Bow his head way down between his knees, and his knees way down in some lonesome, dark and narrer valley, where prayer is much wanted to be made. 'Noint him wid the kerosene ile of salvashun and sot him on fire."

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MINNEAPOLIS, MINN.

comotive stopped and the b.ack-masked man sprang from the cab window and darted across the platform Hardly thinking what she was doing, Polly ran up on the other side, the fireman's side of the engine, and, raising herself up, peered into the cab. She had half expected to see her father's dead body lying on the floor, for she had heard much about the terrible doings of train robbers.

Through the cab window she could see the robber sitting at her own little desk in the depot sending a message It flashed over her all at once that he was wiring to Mercer that the express was delayed, thus preventing any alarm. The robber had pushed up his mask and she saw him plainly.

What should she do? She dared not enter the office, and she, a mere girl, could be of no service where the robbers were making their attack on the train. If only she had the little revolver that lay in the drawer of her desk—she set her teeth as she thought what she would do with it.

At that moment three shots rang out clear and distinct, from the detached train. The man at the telegraph instrument sprang to his feet and ran to a side window in the waiting room and looked up the track.

Now was her chance. Hardly thinking what she did, Polly sprang to the engineer's side of the cab, threw back the reverse lever and opened the throttle. The big steel wheels began to turn, very slowly at first. Farther and farther the throttle opened and faster and faster turned the wheels, and yet they did not go half fast enough to suit Polly, who was now glancing half fearfully over her shoulder.

Suddenly the depot door was thrown open and she saw the robber dart up the track. He had his pistol in his hand. He was pointing it at her and shouting for her to stop. But the engine was now going at good speed and, run, as he would, the robber could not catch it. But he stopped and fired, the bullet ripping through the cab cover above Polly's head.

The engine was now tearing down the track at full speed. Polly knew that it must be fired or it would not go far, and so, leaving the throttle open, she sprang to the coal pit, hung open the fire hole, and with the heavy shovel in her small white hands threw in load after load of coal. When she returned to her place she could see the first signal light of Mercer already blinking into view. She pulled down on the whistle cord and the engine shrieked its distress.

Five minutes later Polly strained at the heavy reverse lever, turned hard on the air brake and brought the great iron horse to a sudden standstill. How she ever managed to stammer the story she never knew, but in a few minutes the engine was headed back with a half a dozen armed men aboard of her. Behind her came another load of men on a switch engine and two men were racing up the street of Mercer calling the alarm.

They heard firing before they reached Kane Creek, but it ceased soon afterward. The robbers had gone. They had taken with them much plunder from the passengers, but they had not been able to get into the express safe, although they were at work drilling it open when relief came

From the time that the engine stopped Polly was missing. When the rescued and excited passengers and express messengers began to crowd around and inquire the Mercer men remembered her. A party of them went out to find the girl who had brought help to the beleagured train.

In a little clump of bushes they heard a man moaning, and an instant later they saw Polly kneeling in the sand, with her father's head in her lap, crying bitterly. And they gathered up the brave engineer and his daughter and carried them down to the train, cheering all the way.

Engineer Marshall was not badly hurt, and he was able to be in Mercer when the general manager of the road thanked the blushing Polly officially and offered a new and better position in Mercer. And of course all the passengers and express messengers heard all about Polly's brave deed and said a great many pleasant things about her, but Polly being a sensible girl, only blushed and said she had to do it, and that any other girl would have done the same under the circumstances—which no one believed, of course.

Later, when the robbers were captured, Polly was able to identify one of them positively—the one who had run the engine—and through him the entire party was convicted and sentenced to the penitentiary.—Waverly.

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It croaks and feeds on unclean things;
Nor lets the shadow of a doubt
Soften the lie it furrows out.

With tongue blades keener than a knife,
It probes the bleeding wound of life,
Lays bare the motives and the deed,
And carrion makes from flower seeds.

It mangles love, and smears with lust
Lillies of purity and trust;
Fattens on sins of king or slave,
And fouls with slime a new-made grave.

* * * * *

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St. Louis is situated on the west bank of the Mississippi River, near the Missiouri. It is midway between New York and San Francisco, the Gulf of Mexico and the Great Lakes. It has 600,000 population, being the fourth city in size in the United States. It has an aera of 62½ square miles, and twenty miles of river frontage; contains 8,000 factories, being the fourth manufacturing city of the world. Twenty-four railroads center there.

* * * * *

HOME-MADE YEAST AND BREAD.

The following way of making yeast and bread from it will be found particularly good for winter time with its cold nights, or in states where the nights are always cool, winter or summer. Take two quarts of mashed potatoes, and while hot add one cup of flour, one cup of salt; stir in well; add enough boiling water to make two gallons of yeast; when lukewarm add two good yeast cakes. In two days—less if it is kept warm—the yeast will be ready for use.

To make bread: Take one quart of yeast, one quart of warm water, no salt—there being enough in the yeast—add flour and mold down at once into a large loaf. Set in a warm place to rise. When light, mold into loaves and put into tins to bake. When light put into a hot oven and bake an hour, or less, according to the size of the loaves. I set my bread in the morning and have it baked by noon. Having no sugar or hops in it, this yeast does not ferment and spoil as other yeast. I have kept it two months by putting it in a cool place. Bread made with this yeast needs no potatoes other than what is in the yeast, and the bread is sweet and wholesome. A friend who has been married over thirty years, tells me she prefers this way of making yeast and bread to any other, and I, after sixteen years' experience, can say the same.—Mabel H Monsey.

* * * * *

Carrie Nation Knocked Him Down.

However much people may disapprove of Carrie Nation's policy of smashing saloons, everybody will be glad that she knocked down the loafer who deliberately walked up to her and blew a large puff of cigarette smoke in her face. She was walking down the street in Charleston, S. C., Nov. 1, when a smart (?) cadet puffed the smoke in her face. The smasher made for him and like the coward that he was, he ran and tried to get away. A crowd surrounded him and Carrie led out and landed on his jaw an the impudent cur went down on the street and a great shout went up from the chivalrous southerners who had witnessed his just punishment.

* * * * *

A few days ago over in Lincoln, Nebraska, E. Benjamine Andrews, voiced the sentiment of most of the people on the foot ball question when he declared to the students of the state university "that the devil and the spirit of foot ball were occasionally in league." If one will read of the brutality, the cruelty, the utter disregard of all rules of safety to the opposition, the deaths, the moanings, the violent temper shown on the foot ball ground, he will certainly endorse every word which the distinguished chancellor uttered on that occasion. The prize fighting, the bull fighting arena, the gladiatorial contests of the old romans were child's play beside the contests on the foot ball field.

* * * * *

The European dog census has been completed and shows that France, with 2,864,000 dogs, holds the European record. Not only are there more dogs in France than in any other country in Europe, but there are more per thousand inhabitants than any other European country. France has 75 dogs to every 1,000 of its inhabitants.

Then follows Ireland with 73, England with 38, Germany with 31 and Sweden with 11. There are 2,200,000 dogs in Germany, 1,500,000 in Russia, and 350,000 in Turkey, though tourists who have resided in Constantinople aver that this number falls short of the actual total, which they think to be larger in Turkey than elsewhere.

In France there is a dog tax and every dog is registered—a condition which makes the computation comparatively easy in that country. The number of dogs in the United States is estimated at from 1,000,000 to 1,500,000.

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Remarkable Discovery Whereby Every One Afflicted with Failing Eyesight, Cataracts or Blindness Can Be Permanently Cured at Home.

An 80-Page Book, "The New System of Treating Diseases of the Eye," Sent Free to All Who Send Name and Address.

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W. O. COFFEE, M. D.

cataracts, blindness or any disease of the eyes can cure themselves at home with mild medicines and without the use of the knife. 13,000 sufferers in all parts of the country were cured last year by his wonderful absorption method. Judge George Edmunds, a leading attorney of Carthage, Ills., 79 years old, was cured of cataracts on both eyes. Mrs. Lucinda Hammond, Aurora, Neb., 77 years old, had cataracts on both eyes and Dr. Coffee's remedies restored her to perfect eyesight. If you are afflicted with any eye trouble write to Dr. Coffee and tell him all about it. He will then tell you just what he can do. He will also send you Free of charge his 80 page book, "The New System of Treating Diseases of the Eye." It is full of interesting and valuable information. All cures are permanent. Write to-day for yourself or friend to W. O. COFFEE, M. D., 450 Good Block, Des Moines, Ia.

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There are in our country 500,000 swindlers, confidence men and similar criminals who annually swindle the people out of several million dollars. **This Book exposes all their Tricks and Schemes.** You cannot be taken in by swindlers after reading it. It is written for the protection of the American people—thousands are waiting for it, millions will buy it. Nearly 450 large pages and splendidly illustrated. **In cloth, only $1.50 postpaid.**

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The business done at the Chicago Union Stock Yards is the largest single business in the world, and the entire industry has more than 45,000 employes and does an annual business of more than $500,000,000.

* * * * *

At the great international medical congress held in London a year ago last summer, Dr. Koch, the eminent German bacteriologist, startled the medcal world by declaring that tuberculosis could not be transmitted from cattle to the human family. Now comes the agricultural department of the United States which declares that its experimments prove that the disease can be transmitted from cattle to the human when the condition of the subject is suitable.

* * * * *

Owing to the trouble between the cattle men of Montana and the Canadian authorities it is proposed to build a wire fence 700 miles long on the boundary line between Montana and Canada. The necessity for this hugh undertaking arises from the fact that several weeks ago a large number of cattle that had strayed into Canada from this state were seized by the dominion officials on the ground that they had been smuggled. The fence will probably be built jointly by the Canadian and American governments and will cost several hundred thousands of dollars.

* * * * *

There are in the civilized world today approximately 200,000,000 cattle 450,000,000 sheep and 125,000,000 swine, of which perhaps 25 per cent of cattle, 45 per cent of sheep and 95 per cent of hogs are annually available for food—making, respectively, about 50,000,000 cattle, 200,000,000 sheep and 120,000,000 swine from the world's stock of primary food animals available for slaughter each year. Of these the United States possessed in 1900, as shown by the twelfth census, 69,438,758 cattle, 61,837,112 sheep and 64,694,222 swine. In other words, we furnish 34.72 per cent of the world's cattle, 13.74 per cent of its sheep and 51.75 per cent of its swine. A careful estimate placed the present value of all the domestic animals in the United States at fully $4,000,000,000.

* * * * *

The Maryland experiment station calls attention to one point that is commonly lost sight of in hog-growing, and that is that the hog is an animal to which sunshine is just as essential as it is to the corn plant. Neither corn nor hogs can be successfully produced without plenty of sunshine. In the South, under normal conditions, it is only necessary to face pens to the south; allow the sun's rays to reach to the back of the pens on the beds and give good shelter and protect them from the north and west winds.

In constructing the hog pens for the station, the following rules have been observed:

1. It is faced to the south so as to permit the rays of the sun to shine upon the beds of the pigs at the extrme rear end of the pen in the winter season and to give shade in that portion in summer.

2. The lattice construction between the pens at the ends and rear admit of a free circulation of air during warm weather.

3. The location of the manure pit in the center and below the level of the sleeping and feeding floors, with all the drainage toward it, materially aids in maintaining a proper sanitary condition.

4. Swinging gates close the pigs in their beds while the manure is being loaded.

5. The manure pit is concreted, which enables the saving of all liquid excrements, which, with the pig, amounts to over 51 per cent of the manure value.

6. Feed bins are placed in front of each pen, which facilitates feeding, and aids in keeping different kinds of feed for each pen, if desired.

* * * * *

Every one who has traveled in Mexico has observed the inferior quality of the cattle in that country. Until recently nothing has been done to improve and better their cattle, but they are waking up to the importance of grading up their stock and are now taking a large number of our cattle to improve the native cattle. The figures show that the trade is growing steadily during the last five years. In 1897 the export values were $36,864; in 1898 it increased to $94,404; in 1899 it had risen to $138,223; in 1900 they were $140,119. If the Mexican cattle breeders will secure good bulls and not cheap, inferior ones, there is no reason why these cattle will not soon rank with the Texas cattle. The writer, during the winter of 1882, went through that country and saw millios of these cattle that were as inferior a lot as any we ever saw.

There were full grown steers that would not weigh more than six to seven hundred pounds. But the Mexican people are seeing that there is no money in raising that kind of stuff and our fine stock breeders should do some missionary work down there and open up a new market for their unfashionable families of fine stock.

* * * * *

Winter Evenings for the Farmer.

(Continued from Page One.)

interested. If we hope to keep the boys and girls on the farms we must not only interest them but sometimes it may be best to amuse them. "All work and no play makes Jack a dull boy." The winter evenings afford opportunity for forming literary clubs or societies, where the young folks can meet and enjoy themselves and at the same time be benefitted by the part they take on the program. A circulating library may be introduced at a slight cost and valuable reading be obtained. If the winter evenings are employed as outlined, the most will be gotten out of them, and they will be a source of much profit.

* * * * *

M. O. Eldridge, Acting Director Office of Public Road Inquiry, U. S. Department of Agriculture: "Successful Farming is at hand. The paper is very attractive in appearance, printed on good paper, and the illustrations are not at all of the cheap variety. * * * The topics discussed are certainly of interest to the farmers."

* * * * *

Texas has more cattle within its borders than any other state. In 1900 it had 9,426,196, Iowa recorded 5,367,630, Kansas 4,491,078, Nebraska 3,176,243 and Illinois 3,104,010. As all cattle, whether dairy cows or not (except the very few that become diseased or die by accident), are eventually turned into beef, practically all may be considered as beef cattle. The quantity and value of the beef obtained, however, is quite another matter. The average value of all the cattle in Texas, according to the twelfth census, was $17.38, Iowa $26.50, Kansas $26.17, Nebraska $25.96, and Illinois $26.47. It is thus seen that the cattle of the other four states named averaged over 50 per cent greater in value than those of Texas. This is largely explained by the fact that Texas is mainly a breeding ground for cattle, while the states of the corn belt constitute the principal feeding territory of the United States, taking the young cattle from Texas and other breeding domains and finishing them for market.

* * * * *

There is a constant strife on the part of all live stock organizations to enhance the quality of animals. This is indicated by the fact that a cattle man recently paid $9,500 for a Hereford bull; another $6,000 for a Shorthorn cow, and many others have given $5,000 each for pure bred bulls. The day of the old style Texas longhorn is past on the range, and he is being supplanted by the thoroughbred aristocrat who "runs to meat instead of horns."

* * * * *

In our new possessions in the Pacific poultry sells very high, chickens selling in Honolulu for $15 a dozen and eggs at fifty cents a dozen.

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PLAN, cut this ad, out and mail to **SEARS, ROEBUCK & CO., Chicago.**

DISEASES OF SHEEP.

As the old saying goes, the winter is the season of discontent to the shepherd. This is because of that want of foresight which is the frequent failure of the human race. The good easy man whose habit is to take things as they come, will never make a successful shepherd. This is for the reason that he never troubles his mind about tomorrow, but goes on the old principle, let every day meet what every day may bring forth. This kind of a shepherd is doubtful of the statement that the inevitable losses of sheep in flocks at the worst need never be more than three out of every hundred, old and young, good, bad and indifferent, and subject to all ordinary accidents, says the American Sheep Breeder.

It is the commonest thing to hear from persons who are complaining that their sheep are not doing well, and they allege that the cause is that sheep were kept on that farm twenty years ago. And there are hundreds of reasons alleged that are good for nothing, for one that touches the actual cause. Generally this is the feeding. Something in it or something that should be, is wanting. After feeding comes the watering. Quite often it is the want of it that is blamed, under the belief that sheep will not drink for days at a time when on good pasture. What a mistake this is. If a flock is watched when it is in the most luxuriant clover and grass pasture, the sheep will be seen to go down to the water several times a day to drink. Even sheep fed in the winter on turnips, of which 92 per cent is water, will drink four or five times a day, and of course will void a proportionate quantity through the kidneys. How few shepherds think of what this simple palpable fact means! What do they think of the office and purpose of these organs? When the good housewife drenches the kitchen floor with water what is the purpose for which she takes such thoughtful pains? Simply to get rid of the wastes of the household, the filth let us say,, which otherwise would gather until the house became polluted and a sink of unwholesomeness, and a most productice source of disease. Now the kidneys of an animal are like this kitchen. Waste matters gather in the animal and pass off through the kidneys. Most of all the excess of protein of the food, which is very inflammatory matter, goes off by the kidneys in the urine which is secreted by them. Thus the kidneys are one of the most important drains of the animal's system, and the more they are brought into action by a full supply of water the more the animal is cleansed and purified. The most common and virulent diseases of animals are those of the nervous system affecting the great spinal nerve, and the brain; the former being the great conveyor of nervous action from the source of it—the brain—to the whole distributed nervous network which supplies the whole body from the great center, the heart and stomachs, to every inch of the skin. Nay, so close are these nerves arranged through the body that the finest needle may not be merely touched to any part, but these myriad sentinels send word to the brain, and the animal starts to escape or struggle; or its vital forces, being inadequate to contend, it drops and lies struggling until it dies. The most frequent diseases of sheep—which figures carefully collected by expert veterinarians all agree to be correct, are those of the nervous system and due to the want of due action of the kidneys.

And now the season is at hand when the shepherd will be worried by the sheep going down, lying on its side with the neck thrown back, struggling with its legs, but unable to stand; or it will be going about in a circle one way or another, or it may stand with its head down pressed against a wall or a fence, or it may wander about aimlessly acting as if blind, and all thus go until in time nature gives way and the sheep slowly die without any possible help. Thus it is important to know and prepare for these troubles which are so frequent that they make up two-thirds of the cases which come to the notice of veterinarians, and scarcely a sheep is saved. To avoid this class of diseases is easy and prevention is the only cure. And this is the way:

Supply pure water in abundance to the sheep. Keep the air in which they breathe pure. Avoid overfeeding with foods too rich in protein, such as alfalfa hay, chiefly; wheat screenings, bran and oil meals. Do not feed too much rich food but let one-half consist of corn fodder, oat straw, peas and oats, hay grown together, and corn meal, with sound clean clover hay; and all feed strictly free from smut, rust, mildew, or any other fungus. Where it is possible let the sheep run in a corn stubble field, and in the fence rows there may be plenty of brushy stuff, elders or briers, or there is an adjacent half-cleared lot, turn them into it in fine weather to get half their feed. This is for the farm flocks; for the range sheep most of the precautions to evade these diseases will be to keep them out of sloughs or swamps, to supply with clean soft water; better let the sheep eat snow than to drink the hard magnesia water so abundant on the plains; and get a supply of good sound grass or alfalfa hay to feed with one-half straw, or corn fodder quite free from smut. By care to thus provide for the health of the flock one may reasonably expect to come out in the spring, barring accidents from storms not prepared for and averted, under the average loss of three in a hundred.

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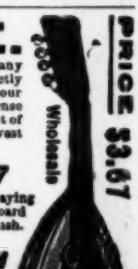

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